CAP-600X
MAY, 2005

ChallengeAIR

# air compressor
# INSTALLATION AND OPERATING INSTRUCTION MANUAL

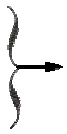
CURTIS

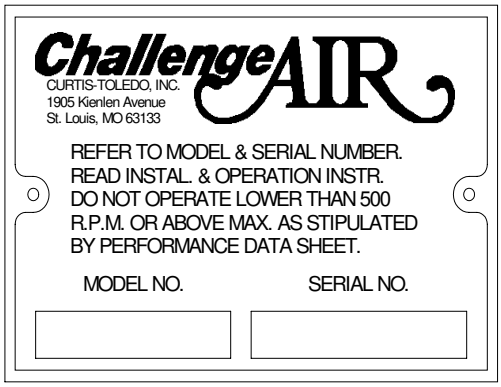
## WARNING

Before installing and operating this compressor, read and understand the safety precautions contained in LV-474 supplement to and part of CAP-600

## IMPORTANT

Make a permanent record of the Model and Serial number of your machine here. You'll save time and expense by including this reference identification on replacement part orders.






***CONSULT FACTORY FOR SPECIAL APPLICATIONS**


## CURTIS-TOLEDO, INC.

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# INSTALLATION

**CONGRATULATIONS** on your new Curtis Challenge Air Compressor. Please examine the compressor for shipping damage(s) and if any are found report it immediately to the carrier.

Select a clean dry location with a rigid floor strong enough to support the compressor. If the compressor is to be located in an area where vibration is critical, properly engineered vibration mounts and flexible piping should be used. Remove the skid. **NOTE: The compressor should never be operated on the shipping skid.** Level the compressor so it can be bolted down securely. Before tightening the bolts, check to see that all four feet are resting on the foundation. Shim as necessary to eliminate stress on the receiver or base when the bolts are tightened. We suggest using a level for proper alignment.

Maximum ambient temperature in which the compressor and motor should be operated is 104°F. Therefore, adequate ventilation must be provided.

The suction openings of the compressor are equipped with a combination air filter-muffler to protect the compressor from normal dust and other harmful substances. If the air around the compressor is excessively hot, dusty, humid or contaminated with foreign gases (such as ammonia or acid fumes) move the filter-muffler to a remote point where the air is clean, cool and dry. Run a pipe to the compressor suction opening. If the run is over 50 feet in length, use a larger pipe to avoid excessive pressure drop. In order to fit the filter to the compressor, bush down the connections. Be sure piping and fittings are clean and free from dirt and chips. If the filter is installed outside, check to insure that it is located above the normal outside dust level, and that rain cannot enter the filter element. Where the relocation of the filter-muffler is not possible or feasible, an oil bath filter is recommended and is available from Curtis.

On basic or base mounted compressors run a discharge pipe to the receiver or optional aftercooler and bush up or down as necessary. The pipe should enter near the top of the receiver. Keep in mind that condensate may form in the discharge line; therefore, the lines should always be pitched to drain condensate away from the compressor. Always provide a safety relief valve in the discharge line between the compressor and in-line shutoff valves. If more than one compressor pumps into a common system, a check valve in the discharge line of each compressor is recommended to prevent moisture from entering the cylinder head when one compressor is idle. A globe or gate valve installed in the discharge line will allow compressor isolation from plant air system for compressor maintenance. (Note: A safety relief valve should be located between the compressor and the globe/gate valve.)

Check the electrical supply for voltage, phase, and frequency to see that they match the nameplate stampings on the motor, magnetic starter, solenoids, and other controls. Use electrical wires of adequate size to carry the full load current of the motor without excessive voltage drop. Charts are available from Curtis (upon request) to provide information on this. The motor must always be protected by a starter with properly sized thermal overload(s). The starter should protect the motor from overheating and burnout due to an overload, low voltage or single phasing of a 3-phase circuit. **Failure to install the proper starter and overloads will void the motor manufacturers warranty.** Follow the National Electric Code or local electric code in providing wiring, fusing and disconnect switches. **NOTE: Do not close the disconnect switch to start the compressor until the procedures outlined under "Startup Procedures" have been completed.**

## LIMITED SAFETY PRECAUTIONS

(Also see supplement LV-474)

The following safety precautions are recommended in the use of this compressor:

1. Use a totally enclosed OSHA-approved belt guard to cover the drive assembly. Where possible, place the flywheel toward the wall, and mount the unit a minimum distance of 2 feet from the wall for maintenance convenience.
2. Turn off & lock out the electrical disconnect switch before working on the unit to prevent the unit from starting unexpectedly
3. Release all air pressure from the system before working on the unit and red tag all electrical control switches, for safety precaution.
4. Do not by-pass motor over-current protection.
5. Do not change the setting or in any way affect the operation of the safety valve.
6. Keep unit securely anchored so that movement will not put a strain on piping, wiring, or air receiver.

**WARNING: Read and understand supplement LV-474 before installing and operating the compressor.**

# START-UP PROCEDURES

**OIL RECOMMENDATION**

Use a good grade of industrial compressor oil (non-detergent) with foam, rust and oxidation inhibitors and a minimum life of 1500 hours in the ASTM D 943 test for oxidation stability.

Ambient Temperatures:

0 - 32º F - Viscosity 180 to 240 SUS at 100º F.
Minimum pour point of - 20º F.
Grade ISO 4
Approved listing:
Chevron-Turban GST Oil 46.
Amoco-Amokon Oil 46.
Conoco-Turban Oil 46.
Shell-Turbo Oil T-46.
Texaco-Regal R & O Oil 46.
Exxon- Teresstic Oil 46

32 - 100º F - Viscosity 300 to 350 SUS at 100º F.
Grade ISO
Approved listing:
Chevron-Turban GST Oil 68.
Amoco-Amokon Oil 68.
Conoco-Turban Oil 68.
Shell-Turbo Oil T-68.
Texaco-Regal R & O Oil 68.
Exxon- Teresstic Oil 68

100 - 110º F - Viscosity 450 to 550 SUS at 100º F.
Grade ISO 100.
Approved listing:
Chevron-Turban GST Oil 100.
Amoco-Amokon Oil 100.
Conoco-Turban Oil 100.
Shell-Turbo Oil T-100.
Texaco-Regal R & O Oil 100.
Exxon- Teresstic Oil 100

If the compressor is equipped with an automatic start-stop control (with pressure switch unloading), it is automatically unloaded upon starting, and will automatically load after attaining running speed. If the compressor is equipped with a constant speed control (pilot valve unloading), it is necessary to manually unload the compressor, if there is pressure in the discharge line, in order to achieve an unloaded start. The compressor must be manually loaded after the compressor has attained full running speed, thereafter, it functions automatically to maintain operating pressure until the unit is shut off.

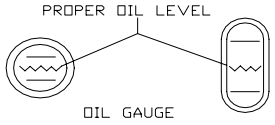
Close the disconnect switch and start the compressor. Observe the direction of rotation, which should be counterclockwise when viewed from the flywheel side of the compressor on all models. For single-phase units, the direction of rotation is determined by the motor nameplate instructions, and is adjusted at the factory. For three-phase units, if the rotation is incorrect, stop the unit and interchange any two of the three wires to the motor at the disconnect switch. This will reverse the direction of rotation of the motor and compressor.

# PREVENTIVE MAINTENANCE

A good maintenance program will add years of service to your air compressor. The following is recommended as a minimum maintenance program. (TURN OFF POWER BEFORE SERVICING.)

**LUBRICATION**

1. For proper lubrication the compressor shall not be operated below the minimum or above the maximum R. P.M. recommended for the various models.
2. Maintain oil level mid-way between the upper and lower lines of the crankcase sight gage. **NOTE ILLUSTRATION:**




3. Stop compressor to add and gauge oil.
4. Do not fill above the upper line and do not operate compressor with oil level below the lower line.

**DO NOT OVER FILL**

5. Change oil at the first 100 hours of operation and 1000 hours thereafter, or as required. It may be necessary to change oil more frequent due to abnormal humid and contaminated conditions.

**DAILY MAINTENANCE**

1. Check and maintain oil level at centerline of sight glass and add oil as necessary.
2. Drain condensate from receiver unless it is equipped with an automatic tank drain, in which case the drain should be checked weekly to see that it is operating. See automatic tank drain instructions.
3. Check for unusual noise or vibration (See "Trouble Shooting".)

**WEEKLY MAINTENANCE**

1. Clean the air filters. A clogged air filter can seriously affect the efficiency of the compressor and cause overheating and oil usage.
2. Clean all external parts of the compressor and driver. Be sure to clean the intercooler-finned surface on two-stage compressors. A dirty compressor will cause abnormally high discharge temperature and resulting oil carbonization on internal valve components
3. Check the safety valve manually (by pulling ring or lever) to see that it is not stuck.

**MONTHLY MAINTENANCE**

1. Inspect the entire air system for leaks.
2. Inspect condition of oil and change if necessary.
3. Check drive belt tension and tighten if needed.

**EVERY 3 MOS. OR 1,000 HRS. OF OPERATION**

1. Change oil.
2. Inspect valves. Clean the carbon from valves and head if necessary.
3. Check and tighten if necessary all bolts, nuts, etc.
4. Check unloader operation.

***CHECKING BELT TENSION**

The v-belt(s) should be adjusted so that a declination of about 3/8 – 1/2 inch will be obtained when it is pushed by a finger at the middle point as shown in Figure 1.

**CAUTION: Over tightening the v-belt(s) will result in overloading of the motor and belt failure, while a loose belt will be slipping and resulting in an unstable speed, overheating the belt and high amp draw.**

**WARNING: Read and understand supplement LV-474 before installing and operating the compressor.**

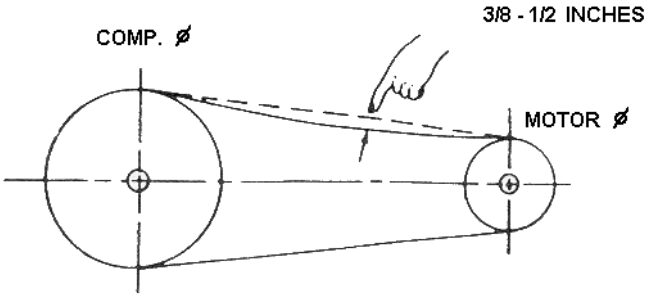



**Figure 1**

To change tension, loosen the motor hold-down bolts and slide the motor on the base, using a lever if necessary, or by turning the adjusting bolt at the end of the base.

Retighten motor hold-down bolts.

**NOTE: Do not over tighten belts.**

**ELECTRIC MOTOR**

Grease once a year with a good grade of lithium ball bearing grease, or as directed by the motor manufacturer.

# VALVE INSPECTION AND MAINTENANCE

Valves should be inspected at regular intervals as recommended under "Maintenance" and cleaned or replaced when necessary. The valve can be serviced without disconnecting air piping or removing the head. **(Be sure the power to the motor is disconnected and all pressure released before starting to work on the compressor.)**

On constant run models, it is necessary to remove the unloader piping before the valve plugs can be removed.

**MODELS E-11 AND E-23 (Figures 2 and 3)**

**A. Disassembly:**

1. Unbolt the outlet valve push cover (70112- 11450).
2. Remove the outlet valve push cover packing (70112-11650), spring (70112-41070) and valve plate (70112-31030). **CAUTION: Steps 1 and 2 are for outlet valve.**
3. Remove the unloading connecting tube for Models E-11 and E-23.
4. Untighten four cylinder head fixed bolts.
5. Remove cylinder head carefully and turn it over.
6. Unbolt inlet valve receiver (70112-31020).
7. Remove valve spring (70112-31070) and valve plate (70112-31030).

   Valves should be inspected approximately every 1,000 hours of operation. Inspect the valve seats on cylinder head for dents, cracks or wear. Replace all defective parts. Remove carbon deposits and wash all valve components in a suitable non-flammable cleaning fluid.

**B. Assembly:**

1. Place outlet valve plate (70112-31030) in position.
2. Place the outlet valve push cover packing (70112-11650) in position.
3. Insert the spring (70112-41070) into outlet valve push cover (70112-11450).
4. Turn outlet valve push cover (70112-11450) in position carefully.
5. Check the valves to see if they can move freely in their guides.
6. Turn over the cylinder head (70112-11010).
7. Place the inlet valve plate (70112-31030) in position.
8. Insert the small end of inlet valve spring (70112-31070) into position of valve receiver (70112- 31020).
9. Screw inlet valve receiver in position.
10. Check the valves to see if they can move freely in their guides and do not pinch or bind between the seat and guard legs.

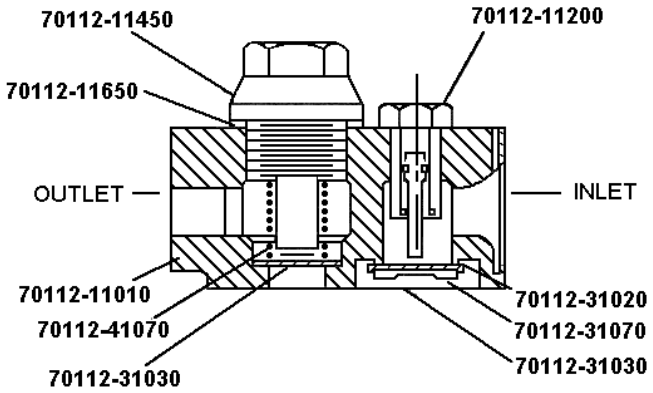



**Figure 2**

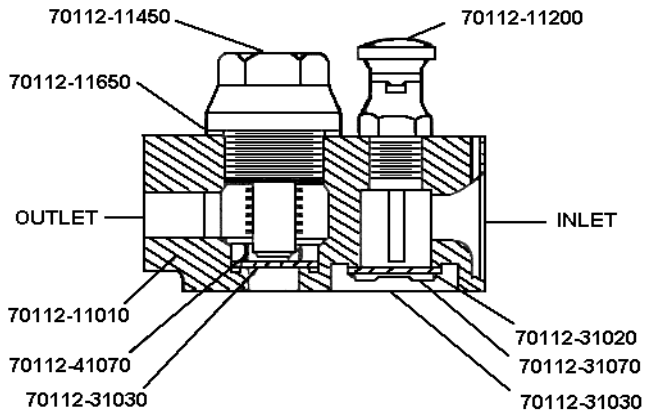



**Figure 3**

**WARNING: Read and understand supplement LV-474 before installing and operating the compressor.**

**MODELS E-50, E-71 AND E-15 (Figures 4 and 5)**

A. **Disassembly of Inlet Valve Assembly (Figure 4)**.
1. Untighten the hex nut.
2. Remove unloading fork (70123-31080), unloading fork guide (70123-31090), unloading spring (70123-11230) and valve seat (70123-31010).

**CAUTION:**
1. **If a vise is used to hold the valve assembly, be careful not to clamp the assembly too tight.**
2. **Valve assembly should be inspected approximately every 1,000 hours of operation.**
3. **Inspect the valve seat for dents, cracks or wear.**
4. **Replace all defective parts.**
5. **Valve seats that might be worn after years of operation can be re-lapped or re-ground, in this case the recess in which the valve guard legs fit must also be cut down accordingly to ensure a same valve lift.**
6. **Remove carbon deposits and wash all valve components in a suitable non-flammable cleaning fluid.**

**B. Reassembly of Inlet Valve Assembly**
1. Place valve spring (70123-31070) and valve plate (70123-31030) on valve receiver (70123-31020).
2. Place valve seat (70123-31010), unloading fork guide 70123-31090), unloading spring (70123- 11230) and unloading fork (70123-31080) respectively.
3. Tighten the valve assembly by tightening the hex nut.
4. Check the valves to see if they can move freely in their guides and do not pinch or bind between the seat and guard legs.

C. **Disassembly of Outlet Valve Assembly (Figure 5)**
1. Untighten the hex nuts.
2. Remove valve receiver (70123-41020), valve spring (70123-41070) and valve plate (70123-31030).

CAUTION: Refer to disassembly of inlet valve assembly (paragraph B).

**D. Reassembly of Outlet Valve Assembly**
1. Place valve spring (70123-41070) in valve receiver 70123-41020).
2. Place valve plate (70123-31030) in valve receiver. (70123-41020).
3. Insert the sub-assembled part (assembled in step I and 2) into valve seat (70123-41010).
4. Tighten the hex nuts.
5. Check the valves to see if they can move freely in their guides and do not pinch or bind between the seat and guard legs.

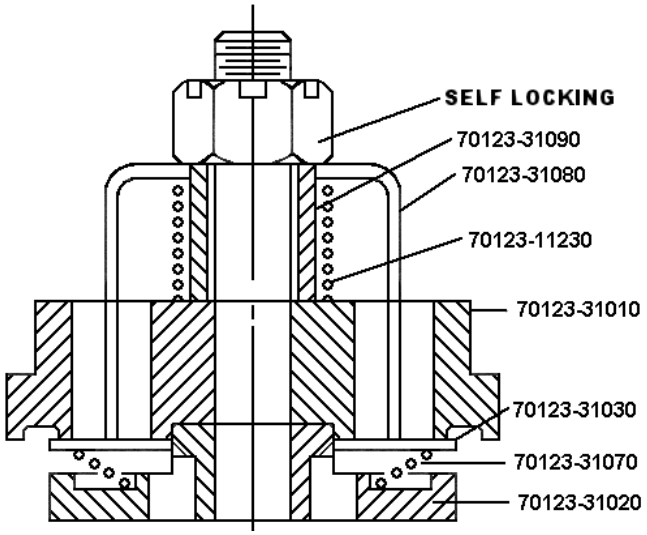



**FIGURE 4** **(EXAMPLE SHOWN E-50)**

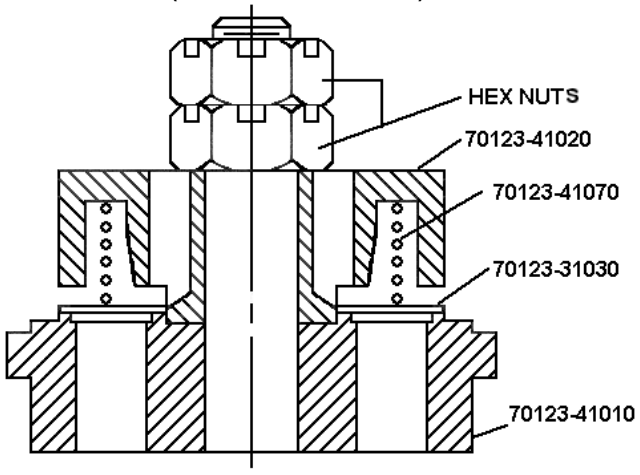



**FIGURE 5** **(EXAMPLE SHOWN E-50)**

**WARNING: Read and understand supplement LV-474 before installing and operating the compressor.**

## VALVE ASSEMBLY INSTALLATION - E-50 MODEL

**(Figures 6 and 7)**

1. Install valve assembly gasket (70123-11110)
2. Install valve assembly (70123-31000).
3. Install valve push cover (70123-11150).
4. Install head bolt and tighten evenly and securely.

It is strongly recommended that a Preventative Maintenance Kit & Valve/Gasket Maintenance Kit be kept on hand. In this manner, the valves can be used in turn to keep the compressor always in good condition and a minimum downtime.

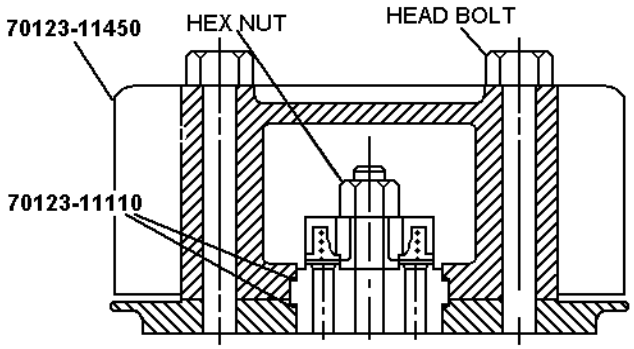



**FIGURE 6**

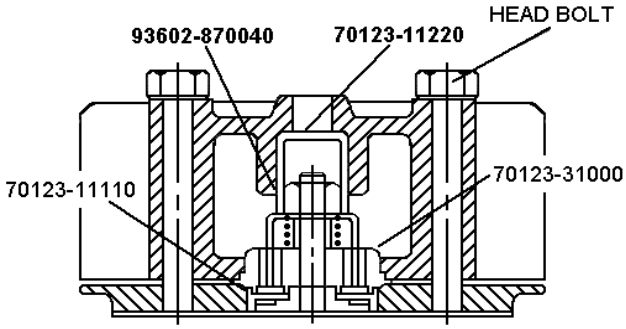



**FIGURE 7**

### PISTON RINGS (Rebuild Kit)

To inspect or replace piston rings as follows:

1. Remove cylinder head.
2. Remove cylinder.
3. Loosen the connecting rod bolts.
4. Push out the piston with piston rings and connecting rod.
5. To remove the old rings, pry them out of their grooves and slide them over the piston. Care should be taken not to damage the piston.
6. Inspect the ring grooves for nicks and carbon deposits. Clean the ring grooves and remove the obstructions, which might prevent the rings from moving freely.

**To install new rings on the piston as follows: (Be careful not to damage the piston and rings).**

1. Install the oil control ring (70123-61050) first. Rotate ring in groove to make sure it is free.
2. Install the Compression ring (70123-61030). Make sure the "top" or "R" mark is exactly on top. If not, it might cause excessive oil consumption.
3. Repeat the process with other rings, if any.
4. Assemble connecting rod into the crankshaft. Be sure that the connecting rod and its cap are in original pair and position, since the connecting rod cap and crankshaft pin bushing are selected fitted and are not interchangeable.
5. Check if the ring gaps are in proper positions (Figure 8).

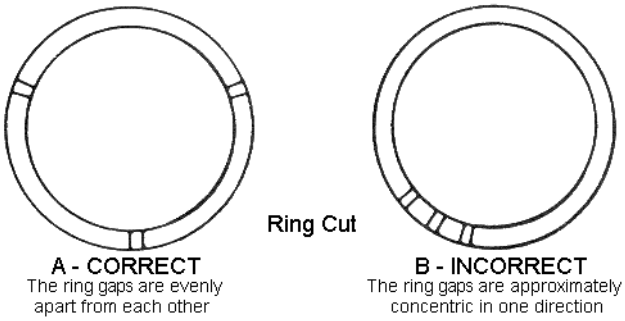

Ring Cut
A - CORRECT
The ring gaps are evenly apart from each other
B - INCORRECT
The ring gaps are approximately concentric in one direction

**FIGURE 8**

**WARNING: Read and understand supplement LV-474 before installing and operating the compressor.**

- REBUILD KITS

# AIR COOLED SINGLE STAGE MODELS

## ES03

| PART NO. | | CONSISTS OF: | |
|---|---|---|---|
| CF1299 | 1 | 70111-66140 | Filter Element |
| | 2 | 70111-31030 | Valve Disc |
| | 1 | 70111-31070 | Spring |
| | 1 | 70111-41070 | Spring |
| | 1 | 70111-11461 | Gasket |
| | 1 | 70111-11612 | Head Gasket |
| | 2 | 70111-61030 | Comp. Ring |
| | 1 | 70111-61050 | Oil Ring |
| | 1 | 70111-57970 | Bottom Cover Gasket |
| | 1 | 70111-57950 | Front bearing cover gasket |
| | 1 | 70111-57080 | Front Oil Seal |
| | 1 | 70111-57960 | Rear Cover Gasket |
| | 10 | 92521-190600 | Copper Washer |

## ES05

| PART NO. | | CONSISTS OF: | |
|---|---|---|---|
| CF1237 | 1 | 70111-66140 | Filter Element |
| | 2 | 70112-31030 | Valve Disc |
| | 1 | 70112-31070 | Spring |
| | 1 | 70112-41070 | Spring |
| | 2 | 70112-61030 | Comp. Ring |
| | 1 | 70112-61050 | Oil Ring |
| | 1 | 70112-11612 | Head Gasket |
| | 1 | 70112-51610 | Crankcase Gasket |
| | 1 | 70112-57950 | Front Cover Gasket |
| | 1 | 70112-57960 | Rear Cover Gasket |
| | 1 | 70112-57080 | Oil Seal |
| | 12 | 92521-190800 | Copper Washer |
| | 1 | 70112-11461 | Copper Gasket |

## ES06

| PART NO. | | CONSISTS OF: | |
|---|---|---|---|
| CF1302 | 2 | 70111-66140 | Filter Element |
| | 4 | 70111-31030 | Valve Disc |
| | 2 | 70111-31070 | Spring |
| | 2 | 70111-41070 | Spring |
| | 2 | 70111-11461 | Gasket |
| | 2 | 70111-11612 | Head Gasket |
| | 2 | 70121-51610 | Crankcase Gasket |
| | 4 | 70111-61030 | Comp. Ring |
| | 2 | 70111-61050 | Oil Ring |
| | 1 | 70121-57950 | Front Cover Gasket |
| | 1 | 70111-57960 | Rear Cover Gasket |
| | 1 | 70121-57970 | Bottom Cover Gasket |
| | 24 | 92521-190600 | Copper Washer |

## ES10, ES10P

| PART NO. | | CONSISTS OF: | |
|---|---|---|---|
| CF1238 | 2 | 70111-66140 | Filter Element |
| | 4 | 70112-31030 | Disc |
| | 2 | 70112-31070 | Spring |
| | 2 | 70112-41070 | Spring |
| | 4 | 70112-61030 | Compression Ring |
| | 2 | 70112-61050 | Oil Ring |
| | 2 | 70112-11612 | Head Gasket |
| | 2 | 70112-51610 | Crankcase Gasket |
| | 1 | 70122-57950 | Front Cover Gasket |
| | 1 | 70122-57960 | Rear Cover Gasket |
| | 1 | 70122-57080 | Front Oil Seal |
| | 24 | 92521-190800 | Copper Washer |
| | 2 | 70112-11461 | Copper Gasket |

## ES20

| PART NO. | | CONSISTS OF: | |
|---|---|---|---|
| CF1239 | 3 | 70111-66140 | Filter Element |
| | 6 | 70112-31030 | Disc |
| | 3 | 70112-31070 | Spring |
| | 3 | 70112-41070 | Spring |
| | 6 | 70112-61030 | Compression Ring |
| | 3 | 70112-61050 | Oil Ring |
| | 3 | 70112-11612 | Head Gasket |
| | 3 | 70112-51610 | Crankcase Gasket |
| | 1 | 70122-57950 | Front Cover Gasket |
| | 1 | 70122-57960 | Rear Cover Gasket |
| | 1 | 70122-57080 | Front Oil Seal |
| | 26 | 92521-190800 | Copper Washer |
| | 3 | 70112-11461 | Copper Gasket |

## ES-30

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1246 | REBUILD KIT INCLUDES: | |
| 2 | 70123-66140 | Filter Kit |
| 4 | 70123-31030 | Disc |
| 2 | 70123-31070 | Spring |
| 2 | 70123-41070 | Spring |
| 4 | 70123-61030 | Compression Ring |
| 4 | 70123-61050 | Oil Ring |
| 4 | 70123-11110 | Seat Gasket |
| 2 | 70123-11612 | Head Gasket |
| 2 | 70123-51610 | Crankcase Gasket |
| 1 | 70123-57950 | Front Cover Gasket |
| 1 | 70123-57960-01 | Rear Cover Gasket |
| 1 | 70123-57080 | Front Oil Seal |
| *2 | 70123-61081 | Bushing |
| 2 | 70123-61090 | Set, Rod Bearing |
| 26 | 92521-191000 | Copper Washer |

## ES-50

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1252 | PREVENTATIVE MAINTENANCE KIT INCLUDES | |
| 3 | 70123-66140 | Filter Element |
| CF1245 | VALVE / GASKET MAINT. KIT INCLUDES | |
| 6 | 70123-31030 | Disc |
| 3 | 70123-31070 | Spring |
| 3 | 70123-41070 | Spring |
| 6 | 70123-11110 | Seat Gasket |
| 3 | 70123-11612 | Head Gasket |
| CF1244 | REBUILD KIT INCLUDES: | |
| 1 | 70123-57080 | Front Oil Seal |
| 6 | 70123-61030 | Compr.Ring |
| 6 | 70123-61050 | Oil Ring |
| *3 | 70123-61081 | Bushing |
| 3 | 70123-61090 | Set, Rod Bearing |
| 3 | 70123-51610 | Crankcase Gasket |
| 1 | 70123-57950 | Frt. Brg. Cvr. Gasket |
| 1 | 70133-57960 | Rear Brg. Cvr. Gasket |
| 34 | 92521-191000 | Copper Washer |

## ES-100

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1252 | PREVENTATIVE MAINTENANCE KIT INCLUDES | |
| 3 | 70123-66140 | Filter Element |
| CF1243 | VALVE / GASKET MAINT. KIT INCLUDES: | |
| 6 | 70124-31030 | Disc |
| 3 | 70124-31070 | Spring |
| 3 | 70124-41070 | Spring |
| 6 | 70124-11110 | Seat Gasket |
| 3 | 70124-11612 | Head Gasket |
| CF1242 | REBUILD KIT INCLUDES: | |
| 1 | 70124-57950 | Frt. Brg. Cvr. Gasket |
| 6 | 70124-61030 | Compr.Ring |
| 6 | 70124-61050 | Oil Ring |
| 3 | 70124-61080 | Bushing |
| 6 | 70124-61090 | Set, Rod Bearing |
| 3 | 70124-51610 | Crankcase Gasket |
| 1 | 70134-57080 | Front Oil Seal |
| 1 | 70134-57960 | Rear Brg. Cvr. Gasket |
| 34 | 92521-191000 | Copper Washer |

## ES-150

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1252 | PREVENTATIVE MAINTENANCE KIT INCLUDES | |
| 3 | 70123-66140 | Filter Element |
| CF1241 | VALVE / GASKET MAINT. KIT INCLUDES: | |
| 6 | 70125-31030 | Disc |
| 3 | 70125-31070 | Spring |
| 9 | 70125-41074 | Spring |
| 6 | 70125-11110 | Seat Gasket |
| 3 | 70125-87510 | Manifold Gasket |
| 3 | 70125-11610 | Head Gasket |
| ** | 70125-11612 | Head Gasket |
| CF1244 | REBUILD KIT INCLUDES: | |
| 1 | 70134-57080 | Front Oil Seal |
| 6 | 70125-61030 | Compression Ring |
| 6 | 70125-61050 | Oil Ring |
| *3 | 70125-61081 | Bushing |
| 3 | 70125-61090 | Set, Bearing |
| *3 | 70135-51610 | Crankcase Gasket |
| 1 | 70135-57950 | Frt. Brg.Cvr Gasket |
| 1 | 70134-57960 | Rear Brg.Cvr Gasket |
| 24 | 92521-191000 | Copper Washer |

## ES-150A

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1252 | PREVENTATIVE MAINTENANCE KIT INCLUDES | |
| 3 | 70123-66140 | Filter Element |
| CF1320 | VALVE / GASKET MAINT. KIT INCLUDES: | |
| 3 | 70125-31030 | Disc I / V |
| 3 | 70125-31070 | Spring |
| 9 | 701212A1-41075 | Spring |
| 6 | 70125-11110 | Seat Gasket |
| 3 | 70125-41030 | Disc O / V |
| 3 | 70125-11612 | Head Gasket |
| CF1244 | REBUILD KIT INCLUDES: | |
| 1 | 70134-57080 | Front Oil Seal |
| 6 | 70125-61030 | Compression Ring |
| 6 | 70125-61050 | Oil Ring |
| *3 | 70125-61081 | Bushing |
| 6 | 70125-61090 | Set, Bearing |
| *3 | 70135-51610 | Crankcase Gasket |
| 1 | 70135-57950 | Frt. Brg.Cvr Gasket |
| 1 | 70134-57960 | Rear Brg.Cvr Gasket |
| 24 | 92521-191000 | Copper Washer |

* **WARNING** – THESE ITEMS INTERCHANGE WITH PARTS ON SERIAL #3020000 & HIGHER ONLY. CONTACT FACTORY FOR EARLIER SERIES.

** USE WITH SERIAL #A311XXXX AND LATER.
70135-11610 REPLACES 70125-11610

- REBUILD KITS

# AIR COOLED TWO STAGE MODELS

E-11

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1250 | 1 | 70111-66140 Filter Element |
| | 2 | 70112-31030 Disc |
| | 2 | 70162-32030 Disc |
| | 1 | 70112-31070 Spring |
| | 1 | 70162-42070 Spring |
| | 1 | 70112-41070 Spring |
| | 1 | 70162-32070 Spring |
| | 2 | 70112-61030 Compression Ring |
| | 1 | 70112-61050 Oil Ring |
| | 2 | 70162-62030 Compression Ring |
| | 2 | 70162-62050 Oil Ring |
| | 1 | 70112-11612 Head Gasket (1st) |
| | 1 | 70162-12610 Head Gasket (2nd) |
| | 2 | 70112-51610 Crankcase Gasket |
| | 1 | 70122-57950 Front Cover Gasket |
| | 1 | 70122-57960 Rear Cover Gasket |
| | 1 | 70122-57080 Front Oil Seal |
| | 24 | 92521-190800 Copper Washer |
| | 1 | 70112-11461 Copper Gasket |

E-23

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1251 | 2 | 70111-66140 Filter Element |
| | 4 | 70112-31030 Disc |
| | 2 | 70111-31030 Disc |
| | 2 | 70112-31070 Spring |
| | 2 | 70112-41070 Spring |
| | 1 | 70172-32070 Spring |
| | 1 | 70172-42070 Spring |
| | 4 | 70112-61030 Compression Ring |
| | 2 | 70112-61050 Oil Ring |
| | 2 | 70111-61030 Compression Ring |
| | 2 | 70111-61050 Oil Ring |
| | 2 | 70112-11612 Head Gasket (1st) |
| | 1 | 70111-11612 Head Gasket (2nd) |
| | 3 | 70112-51610 Crankcase Gasket |
| | 1 | 70122-57950 Front Cover Gasket |
| | 1 | 70122-57960 Rear Cover Gasket |
| | 1 | 70122-57080 Front Oil Seal |
| | 32 | 92521-190800 Copper Washer |
| | 1 | 70111-11461 Copper Gasket |
| | 2 | 70112-11461 Copper Gasket |

E-35

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1306 | PREVENTATIVE MAINTENANCE KIT INCLUDES: | |
| | 1 | 70152-66141 Element |
| CF1307 | VALVE/GASKET MAINT KIT INCLUDES: | |
| | 4 | 70152-31030 Disc |
| | 2 | 70152-32030 Disc |
| | 4 | 70152-31070 Spring |
| | 2 | 70152-32070 Spring |
| | 1 | 70152-11612 Head Gasket |
| | 1 | 70152-31120 Seat Gasket |
| | 1 | 70152-11622 Seat Gasket |
| CF1308 | REBUILD KIT INCLUDES: | |
| | 1 | 70152-51610 Case Gasket |
| | 1 | 70152-57960 Rear Cover Gasket |
| | 2 | 70152-61030 Comp. Ring |
| | 1 | 70152-61050 Oil Ring |
| | 1 | 70152-61080 Bushing (L.P.) |
| | 1 | 70152-62080 Bushing (H.P.) |
| | 2 | 70152-61090 Rod Bearing Set |
| | 3 | 70152-62030 Compression Ring |
| | 1 | 70152-62050 Oil Ring |
| | 1 | 70152-57950 Front Cover Gasket |
| | 1 | 70127-57080 Front Oil Seal |
| | 6 | 92521-190800 Copper Washer |

E-57

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1291 | PREVENTATIVE MAINTENANCE KIT INCLUDES | |
| | 1 | 70153-66142 Element |
| CF1292 | VALVE/GASKET MAINT KIT INCLUDES: | |
| | 4 | 70153-31032 Disc |
| | 2 | 70153-32032 Disc |
| | 4 | 70153-31072 Spring |
| | 2 | 70153-32072 Spring |
| | 1 | 70153-31120 Head Gasket |
| | 1 | 70153-11612 Seat Gasket |
| | 1 | 70153-11622 Seat Gasket |
| CF1293 | REBUILD KIT INCLUDES: | |
| | 1 | 70153-57951 Front Bearing Gasket |
| | 2 | 70124-61030 Compression Ring |
| | 2 | 70124-61050 Oil Ring |
| | 3 | 70153-62030 Compression Ring |
| | 1 | 70153-62050 Oil Ring |
| | 1 | 70153-61081 Bushing (L.P.) |
| | 1 | 70153-62081 Bushing (H.P.) |
| | 4 | 70153-61090 Rod Bearing (Halves) |
| | 1 | 70153-51611 Case Gasket |
| | 1 | 70123-57080 Oil Seat |
| | 1 | 70153-57961 Rear Bearing Gasket |
| | 26 | 92521-191000 Copper Washer |

E-50

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1315 | PREVENTATIVE MAINTENANCE KIT INCLUDES: | |
| | 2 | 70123-66140 Element |
| CF1253 | VALVE/GASKET MAINT KIT INCLUDES: | |
| | 6 | 70123-31030 Disc |
| | 3 | 70123-31070 Spring |
| | 3 | 70123-41070 Spring |
| | 6 | 70123-11110 Seat Gasket |
| | 3 | 70123-11612 Head Gasket |
| CF1254 | REBUILD KIT INCLUDES: | |
| | 1 | 70123-57950 Front Bearing Gasket |
| | 4 | 70123-61030 Compression Ring |
| | 4 | 70123-61050 Oil Rings |
| | 3 | 70112-61030 Compression Ring |
| | 1 | 70112-61050 Oil Ring |
| | 2 | 70123-61081 Bushing |
| | 1 | 93503TA1725 Needle Bearing |
| | 6 | 70123-61090 Rod Bearing (Halves) |
| | 3 | 70123-51610 Crankcase Gasket |
| | 1 | 70123-57080 Oil Seal |
| | 1 | 70133-57960 Rear Bearing Gasket |
| | 34 | 92521-191000 Copper Washer |
| | 1 | 70173-62080 Bushing |

E-71

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1315 | PREVENTATIVE MAINTENANCE KIT INCLUDES: | |
| | 2 | 70123-66140 Element |
| CF1255 | VALVE/GASKET MAINT KIT INCLUDES: | |
| | 4 | 70124-31030 Disc |
| | 2 | 70123-31030 Disc |
| | 2 | 70124-31070 Spring |
| | 1 | 70123-31070 Spring |
| | 2 | 70124-41070 Spring |
| | 1 | 70123-41070 Spring |
| | 4 | 70124-11110 Seat Gasket |
| | 2 | 70123-11110 Seat Gasket |
| | 2 | 70124-11612 Head Gasket |
| | 1 | 70123-11612 Head Gasket |
| CF1256 | REBUILD KIT INCLUDES: | |
| | 1 | 70124-57950 Front Bearing Gasket |
| | 4 | 70124-61030 Compression Ring |
| | 4 | 70124-61050 Oil Ring |
| | 3 | 70123-61030 Compression Ring |
| | 2 | 70123-61050 Oil Ring |
| | 2 | 70124-61080 Bushing |
| | 1 | 70174-62081 Bushing |
| | 3 | 70124-51610 Gasket |
| | 1 | 70134-57080 Oil Seal |
| | 6 | 70124-61090 Bearing (Halves) |
| | 1 | 70134-57960 Rear Bearing Gasket |
| | 34 | 92521-191000 Copper Washer |

E-15

| PART NO. | CONSISTS OF: | |
|---|---|---|
| CF1315 | PREVENTATIVE MAINTENANCE KIT INCLUDES: | |
| | 2 | 70123-66140 Element |
| CF1257 | VALVE/GASKET MAINT KIT INCLUDES: | |
| | 4 | 70125-31030 Disc |
| | 2 | 70175-42030 Disc |
| | 2 | 70125-31070 Spring |
| | 1 | 70124-31070 Spring |
| | 6 | 70125-41070 Spring |
| | 1 | 70124-41072 Spring |
| | 4 | 70125-11110 Seat Gasket |
| | 2 | 70124-11110 Seat Gasket |
| | 4 | 70125-87510 Manifold Gasket |
| | 2 | 70125-11610 Head Gasket |
| | 1 | 70124-11612 Head Gasket |
| | ** | 70135-11610 Head Gasket |
| CF1258 | REBUILD KIT INCLUDES: | |
| | 4 | 70125-61030 Compression Ring |
| | 4 | 70125-61050 Oil Ring |
| | 3 | 70124-61030 Compression Ring |
| | 2 | 70124-61050 Oil Ring |
| | 2 | 70125-61081 Bushing |
| | 3 | 70125-61090 Rod Bearing (2 Halves) |
| | 3 | 70135-51610 Gasket |
| | 1 | 70134-57080 Oil Seal |
| | 1 | 70135-57950 Front Bearing Gasket |
| | 1 | 70134-57960 Rear Bearing Gasket |
| | 24 | 92521-191200 Copper Washer |
| | 1 | 93503-NK28/30 Needle Bearing *** |
| | 1 | 70175-62080 Bushing **** |

* **WARNING** – THESE ITEMS INTERCHANGE WITH PARTS ON SERIAL #3020000 & HIGHER ONLY. CONTACT FACTORY FOR EARLIER SERIES.

** USE WITH SERIAL #A311XXXX AND LATER.
70135-11610 REPLACES 70125-11610

*** USE WITH SERIAL #A409XXXX AND LATER

**** USE FOR UNITS PRIOR TO SERIAL #A409XXXX

# RING SETS & GASKET SETS

## SINGLE STAGE

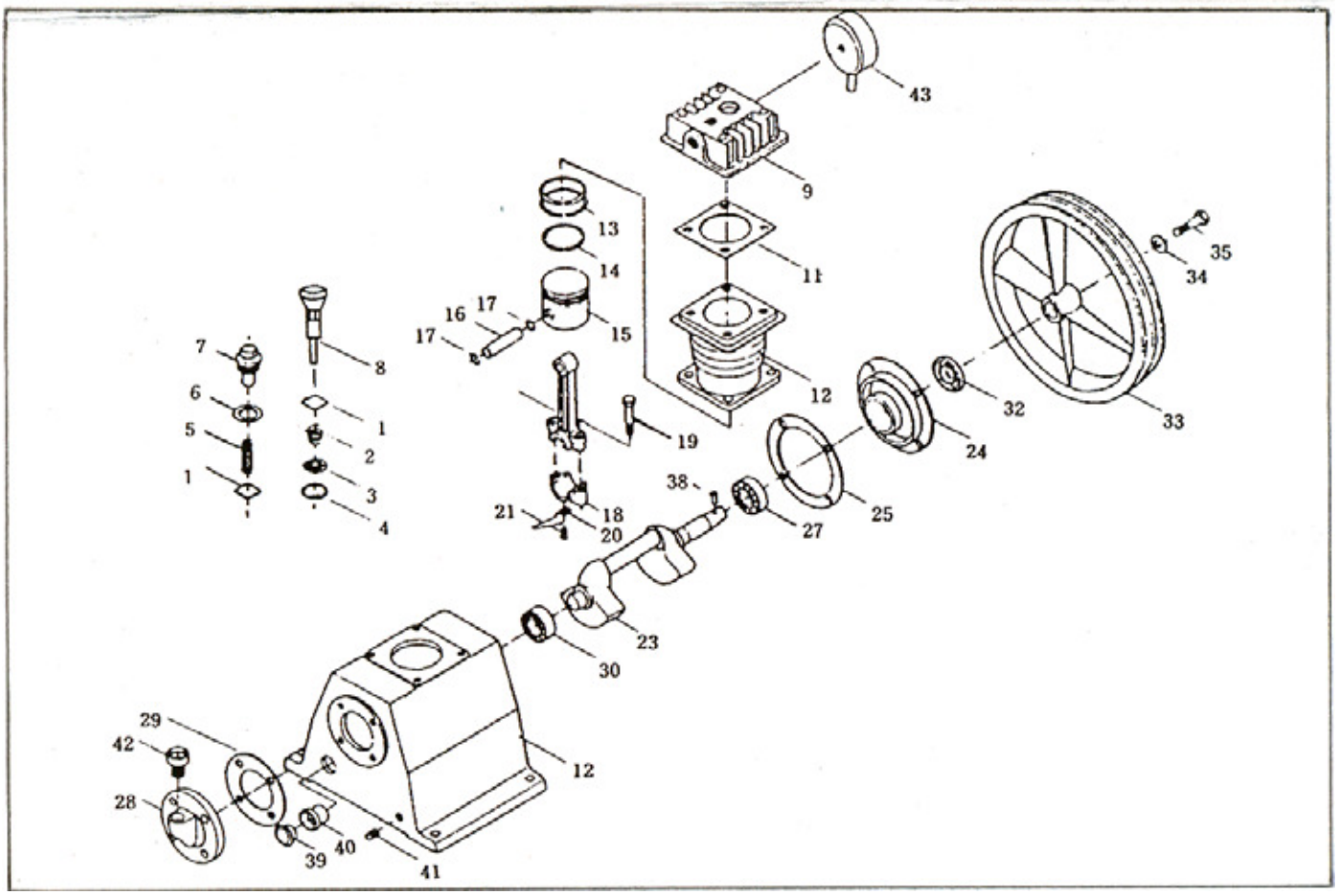
| MODEL | PART NO. | DESCRIPTION | QUANTITY REQ'D |
|---|---|---|---|
| ES03 | CF1297<br>CF1298 | Ring set<br>Gasket set | 1<br>1 |
| ES05 | CF1259<br>CF1276 | Ring set<br>Gasket set | 1<br>1 |
| ES06 | CF1300<br>CF1301 | Ring set<br>Gasket set | 2<br>1 |
| ES10 | CF1260<br>CF1277 | Ring set<br>Gasket set | 2<br>1 |
| ES20 | CF1261<br>CF1278 | Ring set<br>Gasket set | 3<br>1 |
| ES30 | CF1262<br>CF1279 | Ring set<br>Gasket set | 2<br>1 |
| ES50 | CF1263<br>CF1280 | Ring set<br>Gasket set | 3<br>1 |
| ES100 | CF1264<br>CF1281 | Ring set<br>Gasket set | 3<br>1 |
| ES150 &<br>ES150A | CF1265<br>CF1282<br>*CF1311 | Ring set<br>Gasket set<br>*Gasket set | 3<br>1<br>1 |

## TWO-STAGE

| MODEL | PART NO. | DESCRIPTION | QUANTITY REQ'D |
|---|---|---|---|
| E11 | CF1266<br>CF1267<br>CF1283 | Ring set (LP)<br>Ring set (HP)<br>Gasket set | 1<br>1<br>1 |
| E23 | CF1268<br>CF1269<br>CF1284 | Ring set (LP)<br>Ring set (HP)<br>Gasket set | 2<br>1<br>1 |
| E35 | CF1303<br>CF1304<br>CF1305 | Ring set(LP)<br>Ring set(HP)<br>Gasket set | 1<br>1<br>1 |
| E50 | CF1270<br>CF1271<br>CF1285 | Ring set(LP)<br>Ring set(HP)<br>Gasket set | 2<br>1<br>1 |
| E57 | CF1288<br>CF1289<br>CF1290 | Ring set(LP)<br>Ring set(HP)<br>Gasket set | 1<br>1<br>1 |
| E71 | CF1272<br>CF1273<br>CF1286 | Ring set(LP)<br>Ring set(HP)<br>Gasket set | 2<br>1<br>1 |
| E15 | CF1274<br>CF1275<br>CF1287<br>*CF1313 | Ring set(LP)<br>Ring set(HP)<br>Gasket set<br>*Gasket set | 2<br>1<br>1<br>1 |

* USE WITH SERIAL #A311XXXX AND LATER

# MODEL ES-03
# AIR COOLED, SINGLE STAGE, SINGLE CYLINDER

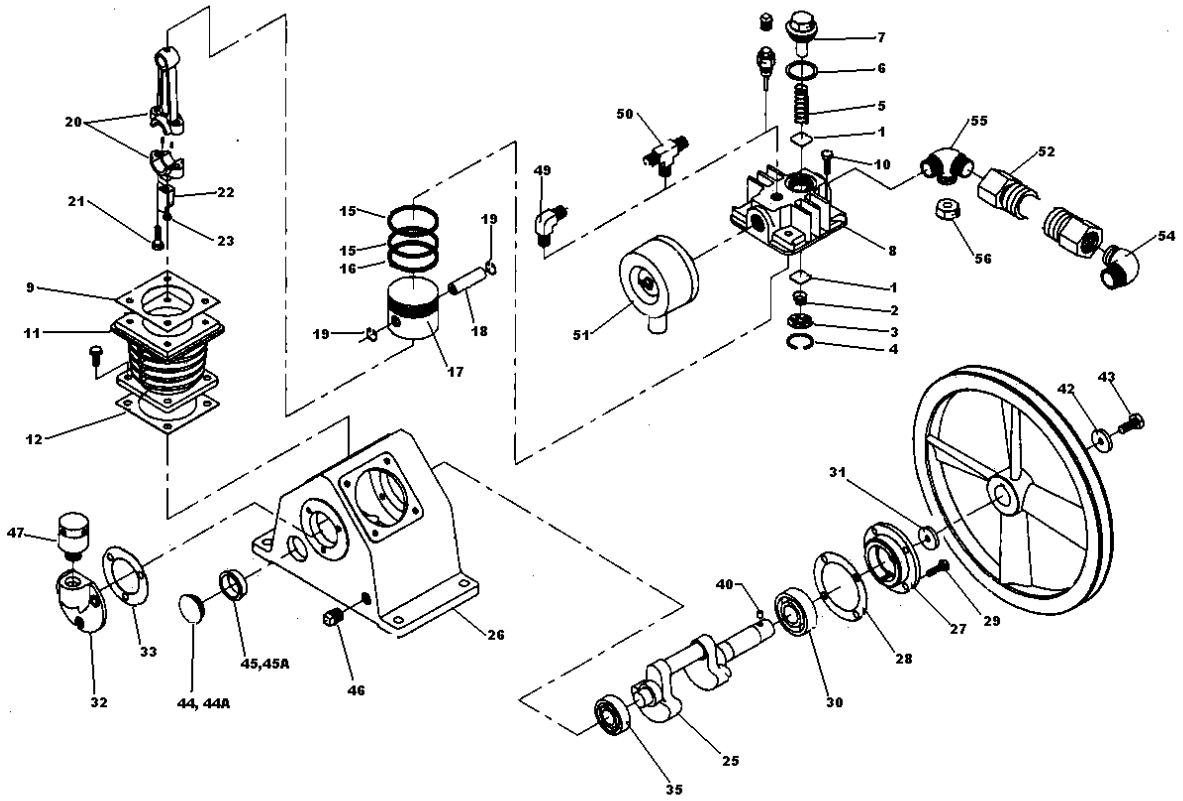



| | Description | QTY | PART NO. |
|---|---|---|---|
| | **VALVES** | | |
| 1. | Inlet & Outlet Valve Plate | 2 | 70111-31030 |
| 2. | Inlet Valve Spring | 1 | 70111-31070 |
| 3. | Inlet Valve Receiver | 1 | 70111-31020 |
| 4. | Inlet Valve Snap Ring | 1 | 93610-130225 |
| 5. | Outlet Valve Spring | 1 | 70111-41070 |
| 6. | Outlet Valve Push Cover Gasket | 1 | 70111-11461 |
| 7. | Outlet Valve Push Cover | 1 | 70111-11450 |
| 8. | Manual Unloader Assembly | 1 | 70111-11300 |
| 9. | | | |
| | **CYLINDERS** | | |
| | | | |
| 9A. | Cylinder Head Assembly (Includes Valves) | 1 | 70111-11000-4024 |
| 9B. | Cylinder Head (Bare Casting) | 1 | 70111-11010 |
| 10. | Cylinder Head Bolt (Not Shown) | 4 | (Hardware Item) |
| 11. | Cylinder Head Gasket | 1 | 70111-11612 |
| 12. | Cylinder & Crankcase | 1 | 70111-57010-4024 |
| 13. | Compression Ring | 2 | 70111-61030 |
| 14. | Oil Control Ring | 1 | 70111-61050 |
| 15. | Piston | 1 | 70111-61011 |
| 16. | Piston Pin | 1 | 70111-61120 |
| 17. | Piston Pin Snap Ring | 2 | 70111-61070 |
| 18. | Connecting Rod Assembly | 1 | 70111-61200 |
| 19. | Connecting Rod Bolt | 2 | (furnished on conn. Rod only) |
| 20. | Oil Splash Dipper | 1 | 70111-61282 |
| 21. | Oil Splash Dipper Bolt | 1 | 91507-2304010 |
| 22. | Oil Splash Dipper Bolt Washer (Not Shown) | 1 | 92522-130400 |

CRANKCASE AND CRANK ASSEMBLY

| | Description | QTY | PART NO. |
|---|---|---|---|
| | **CRANKCASE AND CRANK ASSEMBLY** | | |
| 23. | Crankshaft | 1 | 70111-56010 |
| 24. | Front Bearing Cover | 1 | 70111-57030 |
| 25. | Front Bearing Cover Gasket | 1 | 70111-57950 |
| 26. | Front Cover Bolts (Not Shown) | 4 | 91501-1306016 |
| 27. | Front Bearing #6203 | 1 | 93501-6203 |
| 28. | Rear Bearing Cover | 1 | 70111-57060 |
| 29. | Rear Bearing Cover Gasket | 1 | 70111-57960 |
| 30. | Rear Bearing #6201 | 1 | 93501-6201 |
| 31. | Rear Bearing Cover Bolts (Not Shown) | 3 | 93501-1306016 |
| 32. | Front Oil Seal | 1 | 70111-57080 |
| 33. | Compressor Pulley | 1 | 70111-76010 |
| 34. | Compressor Pulley Thrust Washer | 1 | 70111-76210 |
| 35. | Compressor Pulley Thrust Bolt | 1 | 91501-1306020 |
| 36. | Crankcase Bottom Cover (Not Shown) | 1 | 70111-57220 |
| 37. | Crankcase Bottom Cover Gasket (Not Shown) | 1 | 70111-57970 |
| 38. | Compressor Pulley Pin | NA | (Not Required) |
| 39. | Oil Level Gauge And Cover | 1 | 70111-57700 |
| 40. | Gauge Cover Seal | 1 | 70111-57730 |
| 41. | Crankcase Oil Plug (1/4" PT) | 1 | 90112-100202 |
| 42. | Breather Assembly | 1 | 70191-57600-4024 |
| | **AIR STRAINER ELEMENT** | | |
| 43. | Air Strainer Assembly | 1 | 70111-66001 |
| 44. | Air Strainer Element (Not Shown) | 1 | 70111-66140 |

# MODEL ES-06
# AIR COOLED, SINGLE STAGE, SINGLE CYLINDER

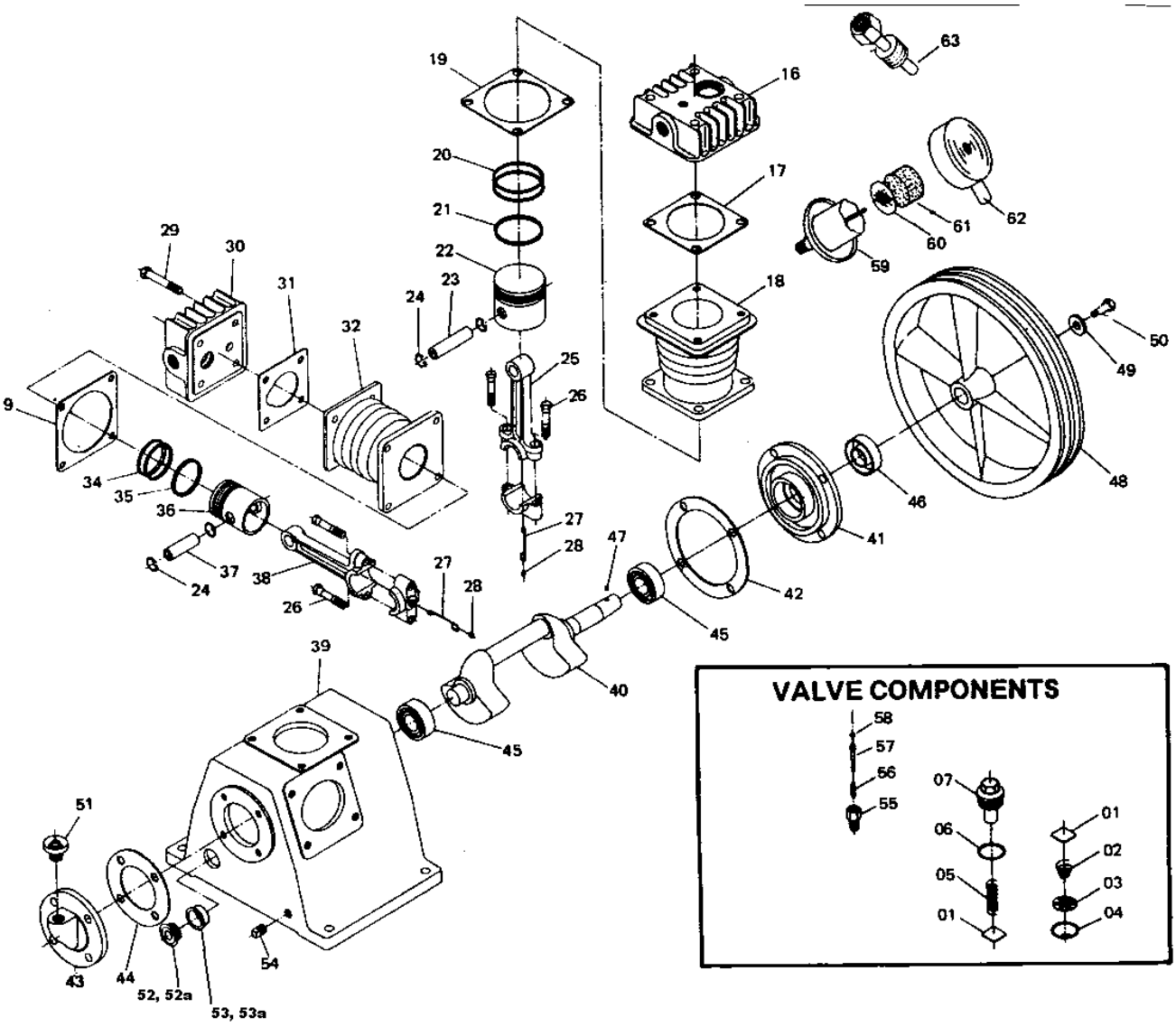



| | DESCRIPTION | QTY | PART NO. | | DESCRIPTION | QTY | PART NO. |
|---|---|---|---|---|---|---|---|
| | **VALVES** | | | 28 | Front Bearing Cover Gasket | 1 | 70121-57950 |
| 1. | Inlet And Outlet Valve Plate | 4 | 70111-31030 | 29 | Front Bearing Cover Bolt | 4 | 91501-1306016 |
| 2. | Inlet Valve Spring | 2 | 70111-31070 | 30 | Front Bearing #6204 | 1 | 93501-6204 |
| 3. | Inlet Valve Receiver | 2 | 70111-31020 | 32 | Rear Bearing Cover | 1 | 70111-57060 |
| 4. | Inlet Valve Snap Ring | 2 | 93610-130225 | 33 | Rear Bearing Cover Gasket | 1 | 70111-57960 |
| 5. | Outlet Valve Spring | 2 | 70111-41070 | 34 | Rear Bearing Cover Bolt (Not Shown) | 3 | 91501-1306016 |
| 6. | Outlet Valve Push Cover Gasket | 2 | 70111-11461 | 35 | Rear Bearing #6203 | 1 | 93501-6203 |
| 7. | Outlet Valve Push Cover | 2 | 70111-11450 | 36 | Crankcase Bottom Cover (Not Shown) | 1 | 70121-57220 |
| | | | | 37 | Crankcase Bottom Cover Bolt (Not Shown) | 1 | 70121-57970 |
| | **CYLINDERS, CRANKCASE AND CRANK ASSEMBLY** | | | 38 | Crankcase Bottom Cover Washer (Not Shown) | 4 | (Hardware Item) |
| 8a. | Cylinder Head Assy. (Includes Valves) | 2 | 70111-11000-4024 | 39 | Front & Rear Cover Bolt Washer (Not Shown) | 10 | 92521-190600 |
| 8b. | Cylinder Head (Bare Casting) | 2 | 70111-11010 | 40 | Compressor Pulley Pin | 1 | 70112-56060 |
| 9. | Cylinder Head Gasket | 2 | 70111-11612 | 41 | Compressor Pulley | 1 | 70121-76011 |
| 10 | Cylinder Head Bolt | 8 | 91501-1306055 | 42 | Compressor Pulley Thrust Washer | 1 | 70112-76210 |
| 11 | Cylinder | 2 | 70121-51010 | 43 | Compressor Pulley Thrust Bolt | 1 | 91501-1306025 |
| 12 | Cylinder To Case Gasket | 2 | 70121-51610 | 44 | Oil Level Gauge & Gauge Cover | 1 | 70111-57700 |
| 13 | Cylinder To Case Bolt (Not Shown) | 8 | 91501-1306016 | *44A | Oil Level Gauge Assy | 1 | 70704-57700 |
| 14 | Cylinder To Case Bolt Washer (Not Shown) | 16 | 92521-190600 | 45 | Oil Level Gauge Cover Seal | 1 | 70111-57730 |
| 15 | Compression Ring | 4 | 70111-61030 | *45A | Oil Level Gauge “O” Ring | 1 | 93602-8126026 |
| 16 | Oil Control Ring | 2 | 70111-61050 | 46 | Crankcase Oil Plug (1/4” NPT) | 1 | 90112-100202 |
| 17 | Piston | 2 | 70111-61011 | 47 | Breather Assembly | 1 | CCC1357 |
| 18 | Piston Pin | 2 | 70111-61120 | | **UNLOADERS(* Indicates Not Included On Basic Units)** | | |
| 19 | Piston Pin Snap Ring | 4 | 70111-61070 | 48 | Auto – Unloader Assembly | 2 | 70112-11201 |
| 20 | Connecting Rod Assembly | 2 | 70111-61200 | 49 | Unloading Elbow* (Includes Nut & Sleeve) | 1 | VA786 |
| 21 | Connecting Rod Bolt | 4 | (Furnished On Conn, Rod Only) | 50 | Unloading Tee* (Includes Nut & Sleeve) | 1 | VA787 |
| 22 | Oil Splash Dipper | 2 | 70121-61282 | | **AIR STRAINER ASSEMBLY & DISCHARGE PIPING** | | |
| 23 | Oil Splash Dipper Bolt | 2 | 91507-2304010 | 51 | Air Strainer Assembly | 2 | 70111-66001 |
| 24 | Oil Splash Dipper Lockwasher (Not Shown) | 2 | 92522-130400 | 52 | Air Strainer Element (Not Shown) | 2 | 70111-66140 |
| 25 | Crankshaft | 1 | 70121-56010 | 53 | Compressor Body Discharge Pipe Assembly | 1 | 70121-87100 |
| 26 | Crankcase | 1 | 70121-57010-4024 | 54 | Outlet Pipe Elbow | 1 | 70121-87010 |
| 27 | Front Bearing Cover | 1 | 70121-57030 | 55 | Outlet Pipe Tee | 1 | 70121-87020 |
| | | | | 56 | Outlet Pipe Tee Nut | 1 | 79922-130404 |

* START S/N AS 4030001

# AIR COOLED, SINGLE STAGE MODELS

ES-05, ES-10 & ES-20

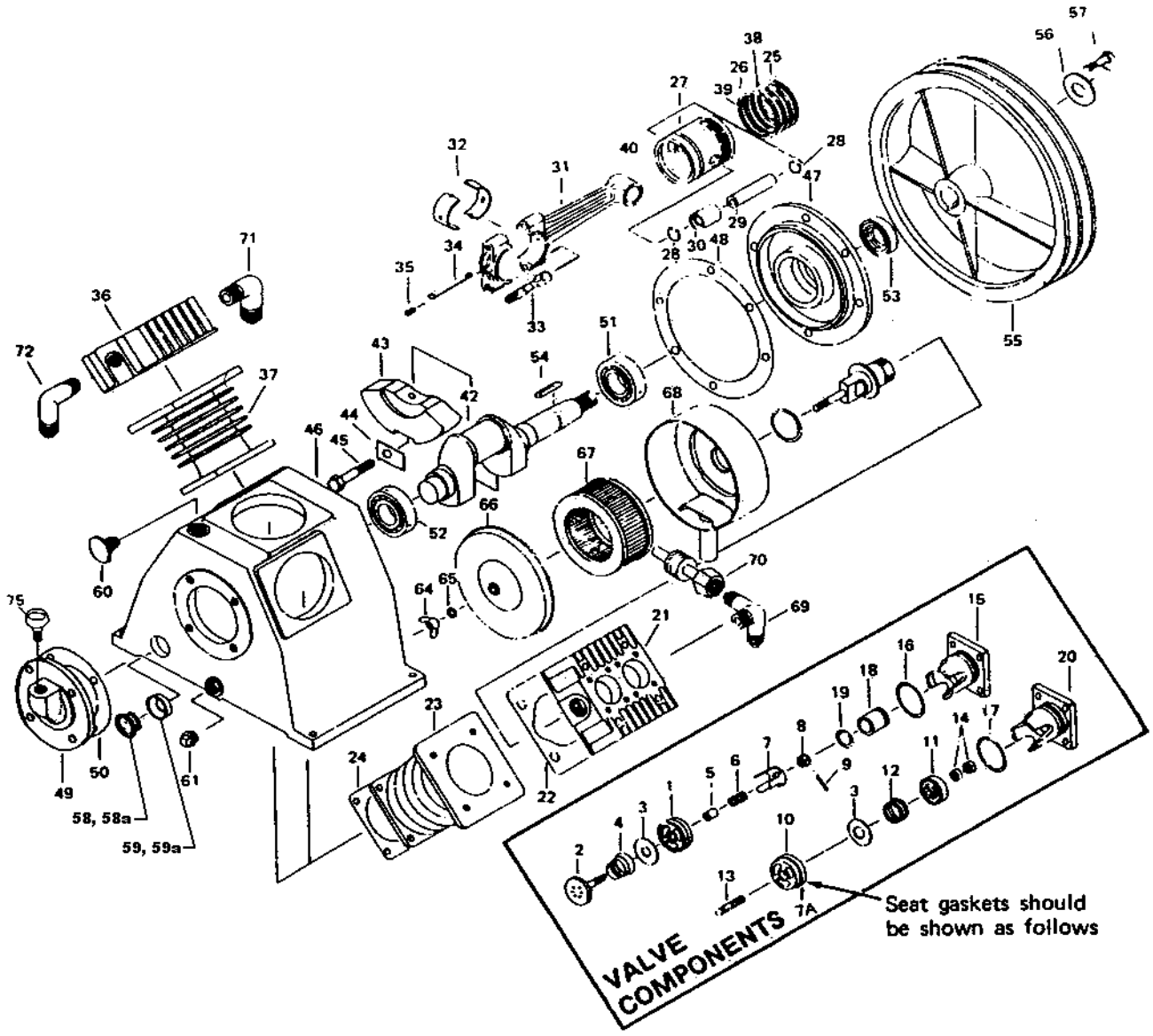


# MAIN PARTS LISTING FOR SINGLE STAGE MODELS ES-05, ES-10 & ES-20

| | VALVES | QTY REQ'D | MODEL ES05 | | QTY REQ'D | MODEL ES10 | | QTY REQ'D | MODEL ES20 |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Inlet And Outlet Valve Plate | 2 | 70112-31030 | | 4 | 70112-31030 | | 6 | 70112-31030 |
| 2. | Inlet Valve Spring | 1 | 70112-31070 | | 2 | 70112-31070 | | 3 | 70112-31070 |
| 3. | Inlet Valve Receiver | 1 | 70112-31020 | | 2 | 70112-31020 | | 3 | 70112-31020 |
| 4. | Inlet Valve Snap Ring | 1 | 93610-130232 | | 2 | 93610-130232 | | 3 | 93610-130232 |
| 5. | Outlet Valve Spring | 1 | 70112-41070 | | 2 | 70112-41070 | | 3 | 70112-41070 |
| 6. | Outlet Valve Push Cover Gasket | 1 | 70112-11461 | | 2 | 70112-11461 | | 3 | 70112-11461 |
| 7. | Outlet Valve Push Cover | 1 | 70112-11450 | | 2 | 70112-11450 | | 3 | 70112-11450 |
| | **CYLINDER AND CYLINDER HEADS** | | | | | | | | |
| 16A. | Cylinder Head Assembly | 1 | 70112-11000-4024 | | 2 | 70112-11000-4024 | | 3 | 70112-11000-4024 |
| 16B. | Cylinder Head | 1 | 70112-11010 | | 2 | 70112-11010 | | 3 | 70112-11010 |
| 17. | Cylinder & Head Gasket | 1 | 70112-11612 | | 2 | 70112-11612 | | 3 | 70112-11612 |
| 18. | Cylinder | 1 | 70112-51010 | | 2 | 70112-51010 | | 3 | 70112-51010 |
| 19. | Cylinder And Case Gasket | 1 | 70112-51610 | | 2 | 70112-51610 | | 3 | 70112-51610 |
| 20. | Compression Ring | 2 | 70112-61030 | | 4 | 70112-61030 | | 6 | 70112-61030 |
| 21. | Oil Control Ring | 1 | 70112-61050 | | 2 | 70112-61050 | | 3 | 70112-61050 |
| 22. | Piston | 1 | 70112-61011 | | 2 | 70112-61011 | | 3 | 70112-61011 |
| 23. | Piston Pin | 1 | 70112-61120 | | 2 | 70112-61120 | | 3 | 70112-61120 |
| 24. | Piston Pin Snap Ring | 2 | 70112-61070 | | 4 | 70112-61070 | | 6 | 70112-61070 |
| 25. | Connecting Rod Assembly | 1 | 70112-61200-1 | | 2 | 70112-61200-1 | | 3 | 70112-61200-1 |
| 26. | Connecting Rod Bolt | 1 | 70112-61250 | | 4 | 70112-61250 | | 6 | 70112-61250 |
| 27. | Oil Splash Dipper | 1 | 70111-61282 | | 2 | 70122-61282 | | 2 | 70122-61282 |
| 27A. | Oil Splash Dipper | | | | | | | 1 | 70132-61290 |
| 28. | Oil Splash Dipper Bolts | 1 | 91507-2304010 | | 2 | 91507-2304010 | | 3 | 91507-2304010 |
| 29. | Cylinder Head Bolt | 4 | (Hardware Item) | | 8 | (Hardware Item) | | 12 | (Hardware Item) |
| | **CRANK ASSEMBLY** | | | | | | | | |
| 39. | Crankcase | 1 | 70112-57010-4024 | | 1 | 70122-57010-4024 | | 1 | 70132-57010-4024 |
| 40. | Crankshaft | 1 | 70112-56010 | | 1 | 70122-56010 | | 1 | 70132-56010 |
| 41. | Front Bearing Cover | 1 | 70112-57030 | | 1 | 70122-57030 | | 1 | 70122-57030 |
| 42. | Front Bearing Cover Gasket | 1 | 70112-57950 | | 1 | 70122-57950 | | 1 | 70122-57950 |
| 43. | Rear Bearing Cover | 1 | 70112-57060 | | 1 | 70122-57060 | | 1 | 70122-57060 |
| 44. | Rear Bearing Cover Gasket | 1 | 70112-57960 | | 1 | 70122-57960 | | 1 | 70122-57960 |
| 45A. | Bearing – Front | 1 | 93501-6205 | | 1 | 93501-6205 | | 1 | 93501-6205 |
| 45B. | Bearing – Rear | 1 | 93501-6204 | | 1 | 93501-6204 | | 1 | 93501-6204 |
| 46. | Front Oil Seal | 1 | 70112-57080 | | 1 | 70122-57080 | | 1 | 70122-57080 |
| 47. | V-Pulley Pin | 1 | 70112-56060 | | 1 | 70112-56060 | | 1 | 70112-56060 |
| 48. | Compressor Pulley | 1 | 70112-76010 | | 1 | 70122-76011 | | 1 | 70122-76011 |
| 49. | Compressor Pulley Thrust Washer | 1 | 70112-76210 | | 1 | 70112-76210 | | 1 | 70112-76210 |
| 50. | Compressor Pulley Thrust Bolt | 1 | 91501-1308025 | | 1 | 91501-1308025 | | 1 | 91501-1308025 |
| 51. | Breather Assembly | 1 | CCC1375 | | 1 | CCC1375 | | 1 | CCC1375 |
| 52. | Oil Gauge & Gauge Cover | 1 | 70111-57700 | | 1 | 70111-57700 | | 1 | 70111-57700 |
| 52 *A | Oil Level Gauge Assembly | | - | | 1 | 70704-57700 | | 1 | 70704-57700 |
| 53. | Gauge Cover Seal | 1 | 70111-57730 | | 1 | 70111-57730 | | 1 | 70111-57730 |
| 53 *A | Oil Level Gauge "O" Ring | | - | | 1 | 93602-8126026 | | 1 | 93602-8126026 |
| 54. | Crankcase Oil Plug | 1 | 90112-100202 | | 1 | 90112-100202 | | 1 | 90112-100202 |
| 54A. | Oil fill cap | | - | | | - | | 1 | 70101-57190-4010 |
| 54B. | "O" Ring | | - | | | - | | 1 | 93601-810016 |
| | **UNLOADERS** | | | | | | | | |
| 55. | Auto – Unloader Assembly | 1 | 70112-11201 | | 2 | 70112-11201 | | 3 | 70112-11201 |
| 56. | Auto – Unloader Spring | 1 | 70112-11230 | | 2 | 70112-11230 | | 3 | 70112-11230 |
| 57. | Auto – Unloader Piston | 1 | 70112-11221 | | 2 | 70112-11221 | | 3 | 70112-11221 |
| 58. | O-Ring (Unloader) | 1 | 93601-810004 | | 2 | 93601-810004 | | 3 | 93601-810004 |
| | **AIR STRAINER** | | | | | | | | |
| 61. | Air Strainer Element | 1 | 70111-66140 | | 2 | 70111-66140 | | 3 | 70111-66140 |
| 62. | Air Strainer Assembly | 1 | 70111-66001 | | 2 | 70111-66001 | | 3 | 70111-66001 |
| 63. | Discharge Piping Assembly | 1 | (Not Required) | | 2 | 70122-87100 | | 2 | 70132-87100 |
| 64. | Outlet Pipe Joint A | | - | | 1 | 70122-87010 | | 1 | 70122-87010 |
| 65. | Outlet Pipe Joint B | | - | | 1 | 70122-87020 | | 1 | 70132-87020 |
| 66. | Outlet Pipe Joint C | | - | | | - | | 1 | 70132-87030 |

- ES10, START S/N AS 4030043
- ES20, START S/N AS 4030061

# AIR COOLED SINGLE STAGE
# MODELS ES-30, ES-50, ES-100

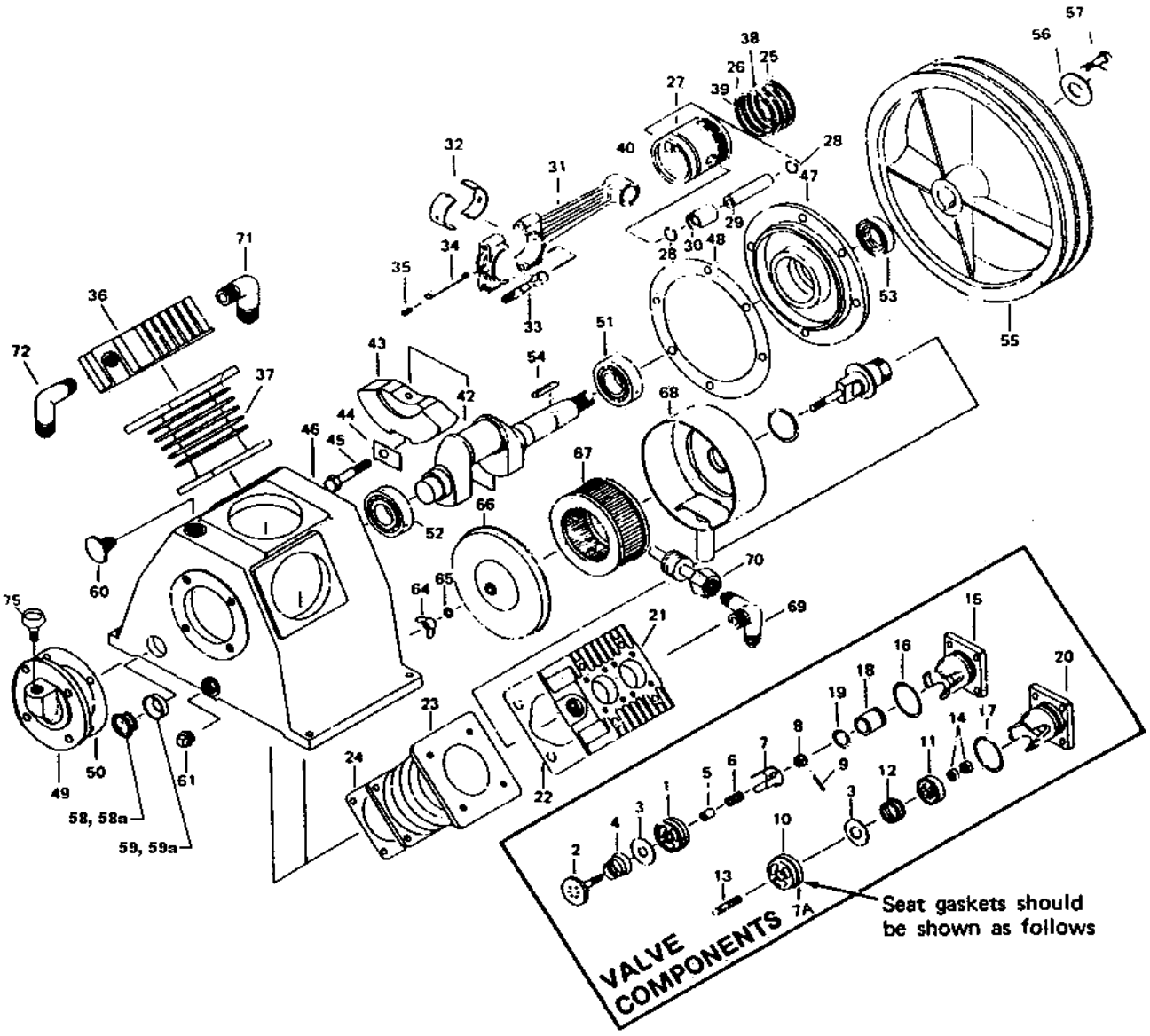



| | Description | Qty. Req. | MODEL ES30 | Qty. Req. | MODEL ES50 | Qty. Req. | MODEL ES100 |
|---|---|---|---|---|---|---|---|
| VALVE ASSEMBLIES | Inlet Valve Assembly, 1st Stage | 2 | 70123-31000 | 3 | 70123-31000 | 3 | 70124-31000 |
| | Outlet Valve Assembly, 1st Stage | 2 | 70123-41000 | 3 | 70123-41000 | 3 | 70124-41000 |
| | Air Strainer Assembly | 2 | 70123-66000 | 3 | 70123-66000 | 3 | 70123-66000 |
| | Breather Assembly | 1 | 70103-57600-4024 | 1 | 70103-57600-4024 | 1 | 70124-57600 |

## MAIN PARTS LISTING FOR MODELS ES-30, ES-50, ES-100

| | Item No. | Description | Qty. Req. | MODEL ES30 | Qty. Req. | MODEL ES50 | Qty. Req. | MODEL ES100 |
|---|---|---|---|---|---|---|---|---|
| VALVE & UNLOADERS | 1. | Inlet Valve Seat | 2 | 70123-31010 | 3 | 70123-31010 | 3 | 70124-31010 |
| | 2. | Inlet Valve Receiver | 2 | 70123-31020 | 3 | 70123-31020 | 3 | 70124-31020 |
| | 3. | Inlet & Outlet Valve Plate | 4 | 70123-31030 | 6 | 70123-31030 | 6 | 70124-31030 |
| | 4. | Inlet Valve Spring | 2 | 70123-31070 | 3 | 70123-31070 | 3 | 70124-31070 |
| | 5. | Inlet Valve Unloading Fork Guide | 2 | 70123-31090 | 3 | 70123-31090 | 3 | 70124-31090 |
| | 6. | Unloading Spring | 2 | 70123-11230 | 3 | 70123-11230 | 3 | 70124-11230 |
| | 7A. | Valve Gasket | 4 | 70123-11110 | 6 | 70123-11110 | 6 | 70124-11110 |

# AIR COOLED SINGLE STAGE
# MODELS ES-30, ES-50, ES-100




| | Description | Qty. Req. | MODEL ES30A | Qty. Req. | MODEL ES50A | Qty. Req. | MODEL ES100A |
|---|---|---|---|---|---|---|---|
| VALVE ASSEMBLIES | Inlet Valve Assembly, 1st Stage | 2 | 701208A1-31000 | 3 | 701208A1-31000 | 3 | 701210A1-31000 |
| | Outlet Valve Assembly, 1st Stage | 2 | 701208A-41000 | 3 | 701208A1-41000 | 3 | 701210A1-41000 |
| | Air Strainer Assembly | 2 | 701208A1-66000 | 3 | 701208A1-66000 | 3 | 701312A1-66000 |
| | Breather Assembly | 1 | 701105A1-57600 | 1 | 701105A1-57600 | 1 | 701210A1-57601 |

## MAIN PARTS LISTING FOR MODELS ES-30A, ES-50A, ES-100A

| | Item No. | Description | Qty. Req. | MODEL ES30A | Qty. Req. | MODEL ES50A | Qty. Req. | MODEL ES100A |
|---|---|---|---|---|---|---|---|---|
| VALVE & UNLOADERS | 1. | Inlet Valve Seat | 2 | 701208A1-31010 | 3 | 701208A1-31010 | 3 | 701210A1-31010 |
| | 2. | Inlet Valve Receiver | 2 | 701208A1-31020 | 3 | 701208A1-31020 | 3 | 701210A1-31020 |
| | 3. | Inlet & Outlet Valve Plate | 2 | 701208A1-31030 | 6 | 701208A1-31030 | 6 | 501210A1-31030 |
| | 4. | Inlet Valve Spring | 2 | 701208A1-31070 | 3 | 701208A1-31070 | 3 | 701210A1-31070 |
| | 5. | Inlet Valve Unloading Fork Guide | 2 | 701208A1-31090 | 3 | 701208A1-31090 | 3 | 701210A1-31090 |
| | 6. | Unloading Spring | 2 | 701208A1-11230 | 3 | 701208A1-11230 | 3 | 701210A1-11230 |
| | 7A. | Valve Gasket | 4 | 701208A1-11110 | 6 | 701208A1-11110 | 6 | 701210A1-11110 |

# MAIN PARTS LISTING FOR MODELS
## ES-30, ES-30A, ES-50 & ES-100 (Continued)

| | | | Qty. Req. | MODEL ES30 | Qty. Req. | MODEL ES50 | Qty. Req. | MODEL ES100 |
|---|---|---|---|---|---|---|---|---|
| VALVES & UNLOADERS (Cont'd) | 7B | Inlet Valve Unloading Fork | 2 | 70123-31080 | 3 | 70123-31080 | 3 | 70124-31080 |
| | 8. | Locknut | 2 | 92518-230800 | 3 | 92518-230800 | 3 | 92518-230800 |
| | 10. | Outlet Valve Seat | 2 | 70123-41011 | 3 | 70123-41011 | 3 | 70124-41011 |
| | 11. | Outlet Valve Receiver | 2 | 70123-41020 | 3 | 70123-41020 | 3 | 70124-41020 |
| | 12. | Outlet Valve Spring | 2 | 70123-41070 | 3 | 70123-41070 | 3 | 70124-41070 |
| | 13. | Outlet Valve Bolt | 2 | 70123-41810 | 3 | 70123-41810 | 3 | 70124-41810 |
| | 14. | Nut (Outlet Valve) | 4 | 92502-130800 | 6 | 92502-130800 | 6 | 92502-130800 |
| | 15. | Inlet Valve Push Cover, 1st Stage | 2 | 70123-11150 | 3 | 70123-11150 | 3 | 70124-11150 |
| | 16. | O – Ring G 40 | 2 | 93602-810040 | 3 | 93602-810040 | 3 | 93602-810055 |
| | 17. | Viton O – Ring G 40 (Outlet Valve) | 2 | 93602-870040 | 3 | 93602-870040 | 3 | 93602-870055 |
| | 18. | Unloading Piston, 1st Stage | 2 | 70123-11220 | 3 | 70123-11220 | 3 | 70124-11220 |
| | 19. | O – Ring P 20 | 2 | 93601-810020 | 3 | 93601-810020 | 3 | 93601-810021 |
| | 20. | Outlet Valve Push Cover, 1st Stage | 2 | 70123-11450 | 3 | 70123-11450 | 3 | 70124-11450 |
| CYLINDERS | 21A. | Cylinder Head Assembly | 2 | 70123-11000 | 3 | 70123-11000 | | - |
| | 21. | Cylinder Head (1st) | 2 | 70123-11010 | 3 | 70123-11010 | 3 | 70124-11010 |
| | 22. | Cylinder & Head Gasket, 1st Stage | 2 | 70123-11612 | 3 | 70123-11612 | 3 | 70124-11612 |
| | 23. | Cylinder (1st) | 2 | 70123-51012 | 3 | 70123-51012 | 3 | 70124-51011 |
| | 23A. | S/N 3020000 THRU A311XXXX | 2 | 70123-51011 | 3 | 70123-51011 | 3 | 70124-51011 |
| | 24. | Cylinder & Case Gasket | 2 | 70123-51610 | 3 | 70123-51610 | 3 | 70124-51610 |
| | 25. | Compression Ring (1st) | 4 | 70123-61030 | 6 | 70123-61030 | 6 | 70124-61030 |
| | 26. | Oil Control Ring (1st) | 4 | 70123-61050 | 6 | 70123-61050 | 6 | 70124-61050 |
| | 27. | Piston (1st) | 2 | 70123-61011 | 3 | 70123-61011 | 3 | 70124-61011-1 |
| | 27A. | S/N 3020000 & later use | 2 | 70123-61011 | 3 | 70123-61011 | 3 | 70124-61011 |
| | 28. | Piston Pin Snap Ring | 4 | 70123-61070 | 6 | 70123-61070 | 6 | 70124-61070 |
| | 29. | Piston Pin (1st) | 2 | 70123-61120 | 3 | 70123-61120 | 3 | 70124-61120 |
| | 30. | Connecting Rod Piston Pin Bushing (1st) | 2 | 70123-61081 | 3 | 70123-61081 | 3 | 70124-61080 |
| | 31. | Connecting Rod Assembly, 1st Stage | 2 | 70123-61200 | 3 | 70123-61200 | 3 | 70124-61201 |
| | 31A. | S/N 3020000 & later use | 2 | 70123-61201 | 3 | 70123-61201 | 3 | 70124-61201 |
| | 32. | Connecting Rod Crank Pin Metal | 4 | 70123-61090 | 6 | 70123-61090 | 6 | 70124-61090 |
| | 33. | Connecting Rod Bolt | 4 | 70123-61250 | 6 | 70123-61250 | 6 | 70125-61250 |
| | 33A. | Oil Splash Dipper H.P. | | - | 1 | 70122-61290 | 1 | 70134-62290 |
| | 34. | Oil Splash Dipper | 2 | 70122-61282 | 2 | 70122-61282 | 2 | 70134-61281 |
| | 35. | Oil Splash Dipper Bolt | 2 | 91507-2304012 | 3 | 91507-2304012 | 3 | 91507-2305016 |
| CRANKCASE & CRANK ASSEMBLY | 42. | Crankshaft | 1 | 70123-56010 | 1 | 70133-56011 | 1 | 70134-56010 |
| | 43. | Counterweight | | - | | - | 2 | 70134-56030 |
| | 44. | Lockwasher | | - | | - | 2 | 70124-56830 |
| | 45. | Bolt | | - | | - | 2 | 70124-56810 |
| | 46. | Crankcase | 1 | 70123-57010-4024 | 1 | 70133-57010-4024 | 1 | 70134-57010-4024 |
| | 47. | Front Bearing Cover | 1 | 70123-57030 | 1 | 70133-57030 | 1 | 70134-57031 |
| | 48. | Front Bearing Cover Gasket | 1 | 70123-57950 | 1 | 70123-57950 | 1 | 70124-57950 |
| | 49. | Rear Bearing Cover | 1 | 70123-57061 | 1 | 70133-57060 | 1 | 70134-57061 |
| | 49A. | S/N 3020000 & later use | 1 | 70123-57061 | 1 | 70133-57061 | 1 | 70134-57061 |
| | 50. | Rear Bearing Cover Gasket | 1 | 70123-57960-01 | 1 | 70133-57960 | 1 | 70134-57960 |
| | 51. | Front Bearing | 1 | 93501-6206 | 1 | 93501-6206 | 1 | 93502-32210 |
| | 52. | Rear Bearing | 1 | 93501-6206 | 1 | 93501-6206 | 1 | 93502-32210 |
| | 53. | Front Oil Seal | 1 | 70123-57080 | 1 | 70123-57080 | 1 | 70134-57080 |
| | 54. | V – Pulley Pin | 1 | 70123-56061 | 1 | 70123-56061 | 1 | 70134-56060 |
| | 55A. | Compressor Fan | 1 | (Not Required) | 1 | (Not Required) | 1 | 70124-76310 |
| | 55B. | Compressor Pulley | 1 | 70123-76010 | 1 | 70133-76010 | 1 | 70134-76011 |
| | 56. | Compressor Pulley Washer | 1 | 70123-76210 | 1 | 70124-76210 | 1 | 70124-76210 |
| | 57. | Compressor Pulley Set Bolt | 1 | 91501-1312030 | 1 | 91501-1312030 | 1 | 91501-1312040 |
| | 58. | Gauge Cover | 1 | 70111-57700 | 1 | 70111-57700 | 1 | 70124-57700 |
| | 58 *A. | Oil Level Gauge Assy. | 1 | 70704-57700 | 1 | 70704-57700 | | - |
| | 59. | Gauge Cover Seal | 1 | 70111-57730 | 1 | 70111-57730 | 1 | 70124-57730 |
| | 59 *A. | Oil Level Gauge "O" Ring | 1 | 93602-8126026 | 1 | 93602-8126026 | | - |
| | 60. | Crankcase Oil Cap | 1 | CCC1257 | 1 | CCC1257 | 1 | CCC1257 |
| | 61. | Crankcase Oil Plug | 1 | 90112-100404 | 1 | 90112-100404 | 1 | 90112-100404 |
| | 67. | Air Strainer Filter | 2 | 70123-66140 | 3 | 70123-66140 | 3 | 70123-66140 |
| | 69. | Outlet Pipe Joint B | 1 | 70123-87020 | 1 | 70133-87020 | 1 | 70134-87020 |
| | 70. | Compressor Body Discharge Piping Assy. | 1 | 70123-87100 | 2 | 70133-87101 | 2 | 70134-87100 |
| | 70A. | S/N 3020000 & Later Use | 1 | 70123-87101 | 2 | 70133-87101 | 2 | 70134-87101 |
| | 71. | Outlet Pipe Joint A | 1 | 70123-87010 | 1 | 70123-87010 | 1 | 70124-87010 |
| | 73. | Outlet Pipe Joint C | | - | 1 | 70133-87030 | 1 | 70134-87030 |
| | 74. | Gasket (Manifold) | | - | | - | | - |
| | 75. | Breather Assembly | 1 | CCC1375 | 1 | CCC1375 | 1 | CCC1375 |

* ES30, START S/N AS4030091

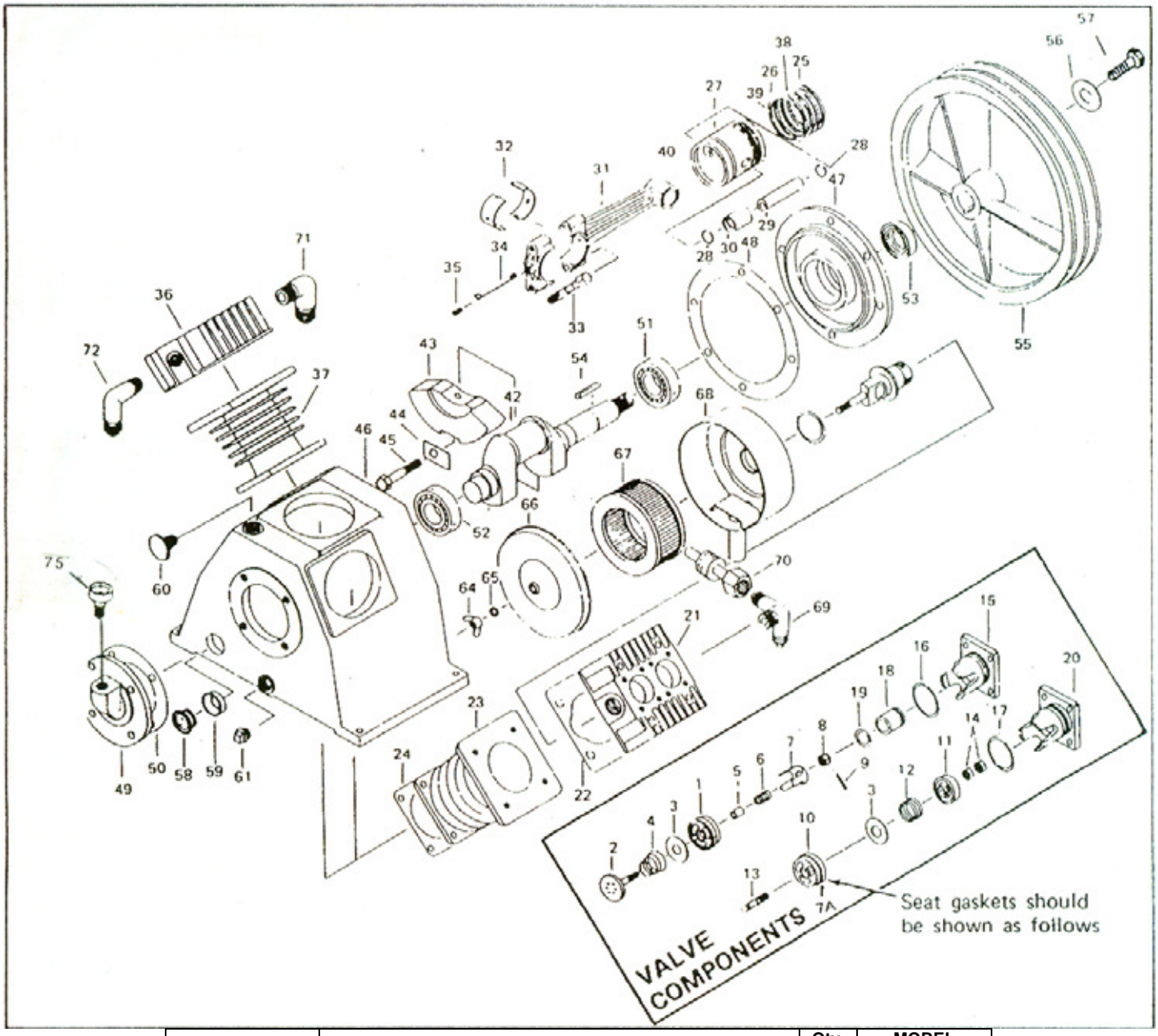
* ES50, START S/N AS4030115

# MAIN PARTS LISTING FOR MODELS
# ES-30A, ES-50A & ES-100A (Continued)

| | | | Qty. Req. | MODEL ES30A | Qty. Req. | MODEL ES50A | Qty. Req. | MODEL ES100A |
|---|---|---|---|---|---|---|---|---|
| VALVES & UNLOADERS (Cont'd) | 7B | Inlet Valve Unloading Fork | 2 | 701208A1-31080 | 3 | 701208A1-31080 | 3 | 70210A1-31080 |
| | 8. | Locknut | 2 | 9251313-150800-532 | 3 | 9251313-150800-532 | 3 | 9251313-151000-532 |
| | 10. | Outlet Valve Seat | 2 | 701208A1-41011 | 3 | 701208A1-41011 | 3 | 701210A1-41011 |
| | 11. | Outlet Valve Receiver | 2 | 701208A1-41020 | 3 | 701208A1-41020 | 3 | 701210A1-41020 |
| | 12. | Outlet Valve Spring | 2 | 701208A1-41070 | 3 | 701208A1-41070 | 3 | 701210A1-41070 |
| | 13. | Outlet Valve Bolt | 2 | 701208A1-41810 | 3 | 701208A1-41810 | 3 | 9152613-1110050-5608 |
| | 14. | Nut (Outlet Valve) | 4 | 9250113-150800-532 | 6 | 9250113-150800-532 | 6 | 9250113-121000-532 |
| | 15. | Inlet Valve Push Cover, 1st Stage | 2 | 701208A1-11150 | 3 | 701208A1-11150 | 3 | 701210A1-11150 |
| | 16. | O – Ring G 40 (G55 ES100) | 2 | 9360281-310394 | 3 | 9360281-310394 | 3 | 9360281-310544 |
| | 17. | Viton O – Ring G 40 (Outlet Valve) | 2 | 9360287-310394 | 3 | 9630287-310394 | 3 | 9360287-310544 |
| | 18. | Unloading Piston, 1st Stage | 2 | 701208A1-11220 | 3 | 701208A1-11220 | 3 | 701210A1-11220 |
| | 19. | O – Ring P 20 (P21 ES100) | 2 | 9360181-240198 | 3 | 9360181-240198 | 3 | 9360187-240208 |
| | 20. | Outlet Valve Push Cover, 1st Stage | 2 | 701208A1-11450 | 3 | 701208A1-11450 | 3 | 701210A1-11450 |
| CYLINDERS | 21A. | Cylinder Head Assembly | 2 | ~~70123-11000~~ | 3 | ~~70123-11000~~ | | - |
| | 21. | Cylinder Head (1st) | 2 | 701208A2-11010 | 3 | 701208A2-11010 | 3 | 701210A2-11010 |
| | 22. | Cylinder & Head Gasket, 1st Stage | 2 | 701208A1-11020 | 3 | 701208A1-11020 | 3 | 701210A1-11020 |
| | 23. | Cylinder (1st) | 2 | 701208A2-51010 | 3 | 701208A2-51010 | 3 | 701210A2-51010 |
| | 23A. | S/N 3020000 THRU A311XXXX | 2 | 701208A1-51010 | 3 | 701208A2-51010 | 3 | 701210A2-51010 |
| | 24. | Cylinder & Case Gasket | 2 | 701208A1-51030 | 3 | 701208A1-51030 | 3 | 701210A1-51030 |
| | 25. | Compression Ring (1st) | 4 | 701208A1-61030 | 6 | 701208A1-61030 | 6 | 701210A1-61030 |
| | 26. | Oil Control Ring (1st) | 4 | 701208A1-61050 | 6 | 701208A1-61050 | 6 | 701210A1-61050 |
| | 27. | Piston (1st) | 2 | 701208A1-61012 | 3 | 701208A1-61012 | 3 | 701210A1-61011 |
| | 27A. | S/N 3020000 & later use | 2 | ~~70123-61011~~ | 3 | ~~70123-61011~~ | 3 | 701210A1-61011 |
| | 28. | Piston Pin Snap Ring | 4 | 701208A1-61070 | 6 | 701208A1-61070 | 6 | 701210A1-61070 |
| | 29. | Piston Pin (1st) | 2 | 701208A1-61120 | 3 | 701208A1-61120 | 6 | 701210A1-61120 |
| | 30. | Connecting Rod Piston Pin Bushing (1st) | 2 | ~~70123-61081~~ | 3 | ~~70123-61081~~ | 3 | ~~70124-61080~~ |
| | 31. | Connecting Rod Assembly, 1st Stage | 2 | 701208A1-61201 | 3 | 701208A1-61201 | 3 | 701210A1-61201 |
| | 31A. | S/N 3020000 & later use | 2 | 701208A1-61201 | 3 | 701208A1-61201 | 3 | 701210A1-61201 |
| | 32. | Connecting Rod Crank Pin Metal | 4 | 70123-61090 | 6 | 70123-61090 | 6 | 70124-61090 |
| | 33. | Connecting Rod Bolt | 4 | 70123-61250 | 6 | 70123-61250 | 6 | 70125-61250 |
| | 33A. | Oil Splash Dipper H.P. | | - | 1 | 70130FA1-61290 | 1 | 701310A1-61290 |
| | 34. | Oil Splash Dipper | 2 | 70120FA1-61282 | 2 | 70120FA1-61282 | 2 | 701310A1-61281 |
| | 35. | Oil Splash Dipper Bolt | 2 | 9151313-1104012-5602 | 3 | 9151313-1104012-5602 | 3 | 9151313-1105016-5602 |
| CRANKCASE & CRANK ASSEMBLY | 42. | Crankshaft | 1 | 701208A1-56011 | 1 | 701308A1-56011 | 1 | 701310A1-56010 |
| | 43. | Counterweight | | - | | - | 2 | 701310A1-56030 |
| | 44. | Lockwasher | | - | | - | 2 | 701210A1-56830 |
| | 45. | Bolt | | - | | - | 2 | 701210A1-56810 |
| | 46. | Crankcase | 1 | 701208A2-57010 | 1 | 701308A2-57010 | 1 | 701310A2-57010 |
| | 47. | Front Bearing Cover | 1 | 701208A1-57030 | 1 | 701308A1-57030 | 1 | 701310A1-57031 |
| | 48. | Front Bearing Cover Gasket | 1 | 701208A1-57040 | 1 | 701208A1-57040 | 1 | 701210A1-57040 |
| | 49. | Rear Bearing Cover | 1 | 701208A1-57061 | 1 | 701308A1-57061 | 1 | 701310A1-57061 |
| | 49A. | S/N 3020000 & later use | 1 | 701208A1-57061 | 1 | 701308A1-57061 | 1 | 701310A1-57061 |
| | 50. | Rear Bearing Cover Gasket | 1 | 701208A1-57070 | 1 | 701308A1-57070 | 1 | 701310A1-57070 |
| | 51. | Front Bearing | 1 | 9350104-6206 | 1 | 9360112-6306 | 1 | 9354501-32210 |
| | 52. | Rear Bearing | 1 | 9350104-6206 | 1 | 9360112-6306 | 1 | 9354501-32210 |
| | 53. | Front Oil Seal | 1 | 701208A1-57080 | 1 | 701208A1-57080 | 1 | 701310A1-57080 |
| | 54. | V – Pulley Pin | 1 | 701208A1-56061 | 1 | 701208A1-56061 | 1 | 701310A1-56060 |
| | 55A. | Compressor Fan | 1 | (Not Required) | 1 | (Not Required) | 1 | 70121071-76311 |
| | 55B. | Compressor Pulley | 1 | 701208A1-76010 | 1 | 701308A1-76010 | 1 | 701310A1-76011 |
| | 56. | Compressor Pulley Washer | 1 | 701208A1-76210 | 1 | 70124-76210 | 1 | 701210A1-76210 |
| | 57. | Compressor Pulley Set Bolt | 1 | 9150113-1112030-5608 | 1 | 9150113-1112030-5608 | 1 | 9150113-1112040-5608 |
| | 58. | Gauge Cover | 1 | ~~70111-57700~~ | 1 | ~~70111-57700~~ | 1 | 701210A1-57740 |
| | 58 *A. | Oil Level Gauge Assy. | 1 | 70A109B1-57701 | 1 | 70A109B1-57701 | 1 | 701210A1-57700 |
| | 59. | Gauge Cover Seal | 1 | ~~70111-57730~~ | 1 | ~~70111-57730~~ | 1 | 701210A1-57730 |
| | 59 *A. | Oil Level Gauge "O" Ring | 1 | 9360281-260265 | 1 | 9360281-260265 | | - |
| | 60. | Crankcase Oil Cap | 1 | CCC1257 | 1 | CCC1257 | 1 | CCC1257 |
| | 61. | Crankcase Oil Plug | 1 | 9156310-400800 | 1 | 9156310-400800 | 1 | 9156310-400800 |
| | 67. | Air Strainer Filter | 2 | 701208A1-66140 | 3 | 701208A-66110 | 3 | 701208A1-66110 |
| | 69. | Outlet Pipe Joint B | 1 | 70123-87020 | 1 | 70133-87020 | 1 | 70134-87020 |
| | 70. | Compressor Body Discharge Piping Assy. | 1 | 70123-87100 | 2 | 701308A1-87101 | 2 | 70134-87100 |
| | 70A. | S/N 3020000 & Later Use | 1 | 701208A1-87101 | 2 | 701308A1-87101 | 2 | 701310A1-87101 |
| | 71. | Outlet Pipe Joint A | 1 | 701208A1-87011 | 1 | 70123-87010 | 1 | 70124-87010 |
| | 73. | Outlet Pipe Joint C | | - | 1 | 70133-87030 | 1 | 70134-87030 |
| | 74. | Gasket (Manifold) | | - | | - | | - |
| | 75. | Breather Assembly | 1 | CCC1375 | 1 | CCC1375 | 1 | CCC1375 |

* ES30, START S/N AS4030091
* ES50, START S/N AS4030115

# AIR COOLED, SINGLE STAGE MODEL
# ES-150




| | DESCRIPTION | Qty. Req. | MODEL ES150 |
|---|---|---|---|
| VALVE ASSEMBLIES | Inlet Valve Assembly, 1st Stage | 3 | 70125-31000 |
| | Outlet Valve Assembly, 1st Stage | 3 | 70125-41000 |
| | Air Strainer Assembly | 3 | 70123-66001 |
| | Breather Assembly | 1 | 70124-57600 |

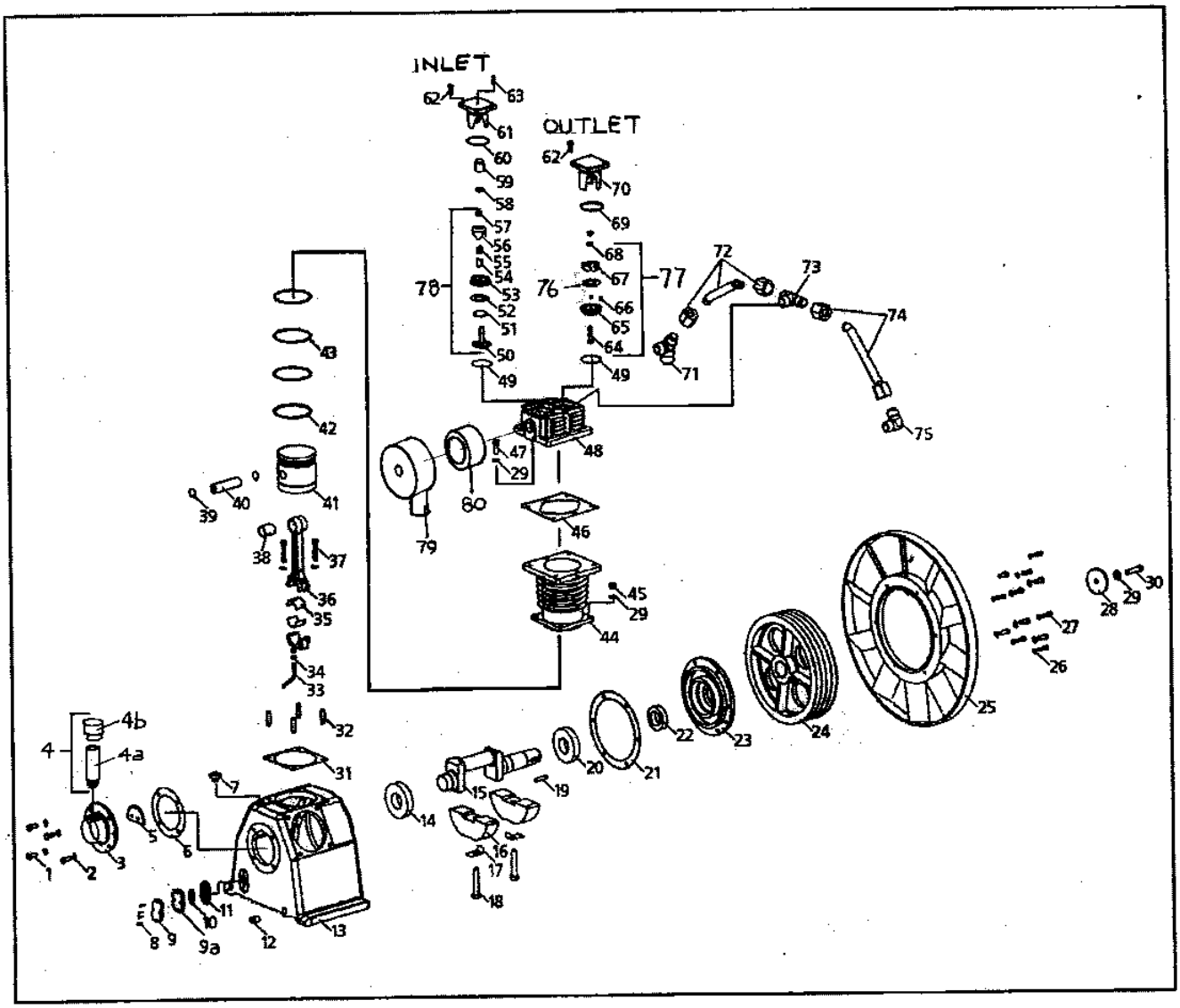
## MAIN PARTS LISTING FOR MODEL ES-150

| | | DESCRIPTION | Qty. Req. | MODEL ES150 |
|---|---|---|---|---|
| VALVE & UNLOADERS | 1. | Inlet Valve Seat | 3 | 70125-31010 |
| | 2. | Inlet Valve Receiver | 3 | 70125-31021 |
| | 3. | Inlet & Outlet Valve Plate | 6 | 70125-31030 |
| | 4. | Inlet Valve Spring | 3 | 70125-31070 |
| | 5. | Inlet Valve Unloading Fork Guide | 3 | 70125-31090 |
| | 6. | Unloading Spring | 3 | 70125-11230 |
| | 7A. | Valve Gasket | 6 | 70125-11110 |

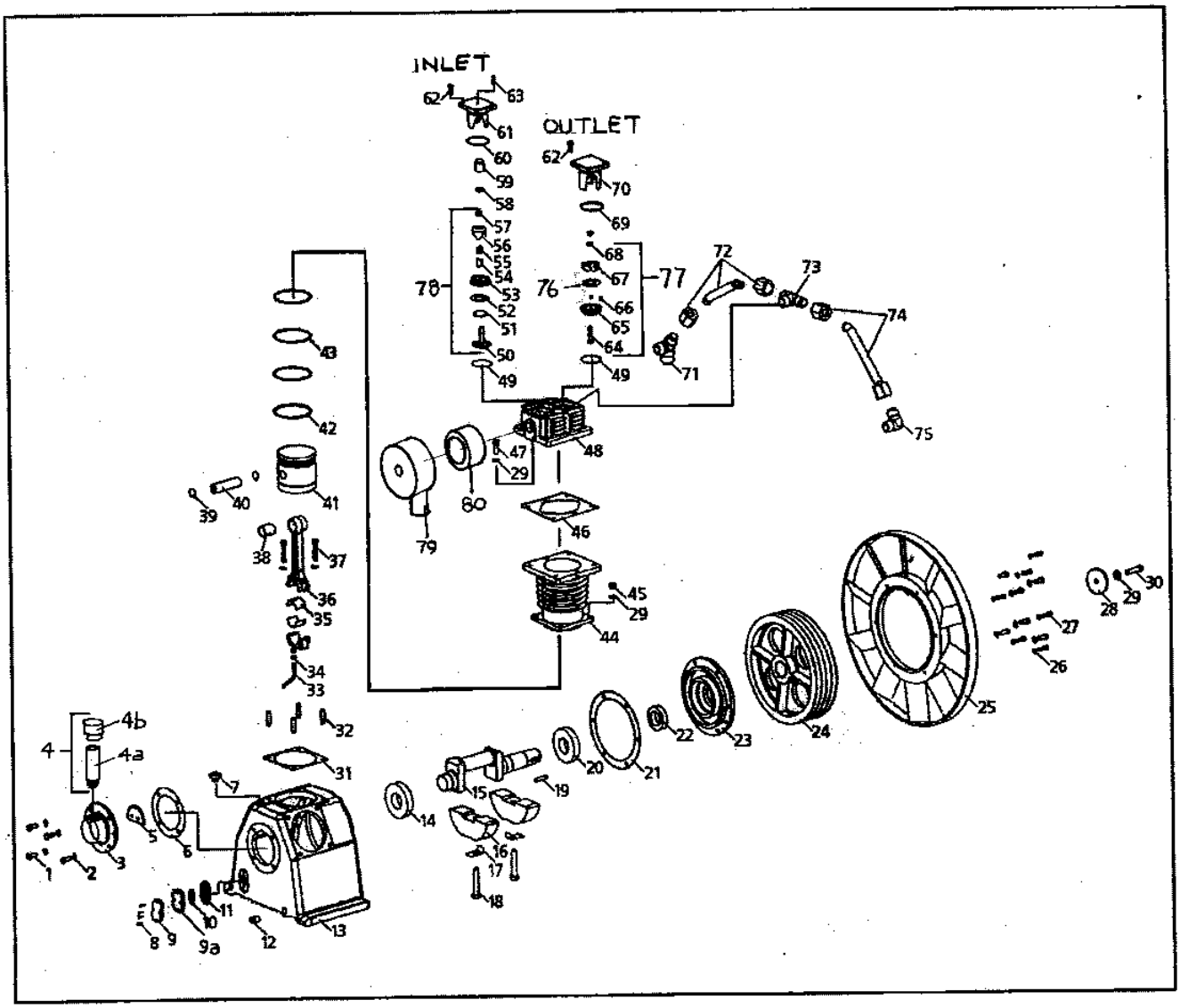
# MAIN PARTS LISTING FOR MODEL ES-150 (Continued)

| | | DESCRIPTION | Qty. Req. | MODEL ES150 |
|---|---|---|---|---|
| VALVES & UNLOADERS (Cont'd) | 7B | Inlet Valve Unloading Fork | 3 | 70125-31080 |
| | 8. | Locknut | 3 | 92517-231200 |
| | 10. | Outlet Valve Seat | 3 | 70125-41011 |
| | 11. | Outlet Valve Receiver | 3 | 70125-41025 |
| | 12. | Outlet Valve Spring | 3 | 70125-41074 |
| | 13. | Outlet Valve Bolt | 3 | 70124-41810 |
| | 14. | Nut (Outlet Valve) | 6 | 92502-131000 |
| | 15. | Inlet Valve Push Cover, 1st Stage | 3 | 70125-11151 |
| | 16. | O – Ring G 65 | 3 | 93602-810065 |
| | 17. | Viton O – Ring G 65 (Outlet Valve) | 3 | 93602-870065 |
| | 18. | Unloading Piston, 1st Stage | 3 | 70125-11220 |
| | 19. | O – Ring P 22A | 3 | 93601-870022A |
| | 20. | Outlet Valve Push Cover, 1st Stage | 3 | 70125-11451 |
| CYLINDERS | 21A. | Cylinder Head Assembly | | 70135-11000A |
| | 21. | Cylinder Head (1st) | 3 | 70125-11010 |
| | 21B. | S/N A311XXXX AND LATER | 3 | 70135-11011 |
| | 22. | Cylinder & Head Gasket, 1st Stage | 3 | 70125-11612 |
| | 22A. | S/N A311XXXX AND LATER | 3 | 70135-11612 |
| | 23. | Cylinder (1st) | 3 | 70135-51011 |
| | 23A. | S/N 3020000 THRU A311XXXX | 3 | 70135-51010 |
| | 23B. | S/N A311XXXX AND LATER | 3 | 70135-51011 |
| | 24. | Cylinder & Case Gasket | 3 | 70135-51610 |
| | 25. | Compression Ring (1st) | 6 | 70125-61030 |
| | 26. | Oil Control Ring (1st) | 6 | 70125-61050 |
| | 27. | Piston (1st) | 3 | 70125-61010 |
| | 27A. | S/N 3020000 & later use | 3 | 70135-61010-1 |
| | 28. | Piston Pin Snap Ring | 6 | 70125-61070 |
| | 29. | Piston Pin (1st) | 3 | 70125-61120 |
| | 30. | Connecting Rod Piston Pin Bushing (1st) | 3 | 70125-61081 |
| | 31. | Connecting Rod Assembly, 1st Stage | 3 | 70125-61200 |
| | 31A. | S/N 3020000 & later use | 3 | 70125-61200 |
| | 32. | Connecting Rod Crank Pin Metal | 6 | 70125-61090 |
| | 33. | Connecting Rod Bolt | 6 | 70125-61250 |
| | 33A. | Oil Splash Dipper H.P. | | - |
| | 34. | Oil Splash Dipper | 3 | 70135-61281 |
| | 35. | Oil Splash Dipper Bolt | 3 | 92501-130800 |
| CRANKCASE & CRANK ASSEMBLY | 42. | Crankshaft | 1 | 70135-56011 |
| | 43. | Counterweight | 2 | 70135-56031 |
| | 44. | Lockwasher | 2 | 70135-56830 |
| | 45. | Bolt | 2 | 70135-56811 |
| | 46. | Crankcase | 1 | 70135-57010-4024 |
| | 47. | Front Bearing Cover | 1 | 70135-57030 |
| | 48. | Front Bearing Cover Gasket | 1 | 70135-57950 |
| | 49. | Rear Bearing Cover | 1 | 70134-57061 |
| | 49A. | S/N 3020000 & later use | 1 | 70134-57061 |
| | 50. | Rear Bearing Cover Gasket | 1 | 70134-57960 |
| | 51. | Front Bearing | 1 | 93502-30310 |
| | 52. | Rear Bearing | 1 | 93502-32210 |
| | 53. | Front Oil Seal | 1 | 70134-57080 |
| | 54. | V – Pulley Pin | 1 | 70134-56060 |
| | 55A. | Compressor Fan | 1 | 70135-76310 |
| | 55B. | Compressor Pulley | 1 | 70135-76011 |
| | 56. | Compressor Pulley Washer | 1 | 70124-76210 |
| | 57. | Compressor Pulley Set Bolt | 1 | 91501-1312050 |
| | 58. | Gauge Cover | 1 | 70124-57700 |
| | 59. | Gauge Cover Seal | 1 | 70124-57730 |
| | 60. | Crankcase Oil Cap | 1 | CCC1257 |
| | 61. | Crankcase Oil Plug | 1 | 90112-100404 |
| | 67. | Air Strainer Filter | 3 | 70123-66140 |
| | 69. | Outlet Pipe Joint B | 1 | 70135-87021 |
| | 70. | Compressor Body Discharge Piping Assy. | 2 | 70135-87100 (Long) |
| | 70A. | S/N 3020000 & Later Use | 2 | 70135-87200 (Short) |
| | 71. | Outlet Pipe Joint A | 1 | 70135-87011 |
| | 73. | Outlet Pipe Joint C | 1 | 70135-87031 |
| | 74. | Gasket (Manifold) | 3 | 70125-87510 |
| | | Discharge Piping Assembly | 1 | 70135-87700 |
| | | Discharge Piping Assembly | 1 | 70135-87800 |
| | | Discharge Piping Assembly | 1 | 70135-87900 |
| | | Copper Connector | | - |
| | | Copper Connector | | - |
| | | Copper Connector | | - |
| | 75. | Breather Assembly | 1 | CCC1258 |

AIR COOLED SINGLE STAGE
MODEL ES-150A



AIR COOLED SINGLE STAGE
MODEL ES-150B



# MAIN PARTS LISTING FOR MODEL ES150A

| ITEM NO. | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 91501-1310025 | BOLT, M10 X 25 | 10 |
| 2 | 92521-191000 | COPPER WASHER | 22 |
| 3 | 70134-57061 | REAR BEARING COVER | 1 |
| 4 | 70131B81-57670 | TUBE & BRTHR. ASSY. | 1 |
| 4a | 70131BA1-57670 | TUBE, BREATHER | 1 |
| 4b | CCC1697 | BREATHER, ASSY. | 1 |
| 5 | 70134-57590 | REAR COVER OIL BAFFLE | 1 |
| 6 | 70134-57960 | REAR BRG CVR PACKING | 1 |
| 7 | 70123-57190-4010 | CRANKCASE OIL CAP | 1 |
| 8 | 91507-2305016 | GAUGE SET BOLT | 4 |
| 9 | 70124-57740 | OIL GLASS & COVER | 1 |
| 9a | 70124-57700 | OIL COVER | 1 |
| 10 | 70124-57750 | OIL COVER GLASS | 1 |
| 11 | 70124-57730 | GAUGE COVER SEAL | 1 |
| 12 | 90112-100404 | CRANKCASE OIL PLUG | 1 |
| 13 | 70135-57010-4024 | CRANKCASE | 1 |
| 14 | 93502-30310 | BEARING #30310 | 1 |
| 15 | 70135-56011 | CRANKSHAFT | 1 |
| 16 | 701312A1-56032 | CRANKSHAFT CTR. WGT. | 2 |
| 17 | 70135-56830 | CTR WGT LK WASHER | 2 |
| 18 | 70135-56811 | CTR WGT MGT BOLT | 2 |
| 19 | 70134-56060 | V-PULLEY KEY | 1 |
| 20 | 93502-32210 | BEARING #32210 | 1 |
| 21 | 70135-57950 | FRONT BEARING GASKET | 1 |
| 22 | 70134-57080 | FRONT OIL SEAL | 1 |
| 23 | 70135-57030 | FRONT BEARING COVER | 1 |
| 24 | 70135-76011 | COMPRESSOR PULLEY | 1 |
| 25 | 70135-76310 | COMP PULLEY FAN | 1 |
| 26 | 92522-130800 | WASHER | 6 |
| 27 | 91501-2308030 | BOLT | 6 |
| 28 | 70124-76210 | PULLEY THRUST WASHER | 1 |
| 29 | 92522-131200 | SPRING WASHER | 31 |
| 30 | 91501-1312050 | BOLT | 1 |
| 31 | 70135-51610 | CYL & CASE PACKING | 3 |
| 32 | 70135-51810 | CYL & CASE BOLT | 12 |
| 33 | 70135-61281 | OIL SPLASH DIPPER | 3 |
| 34 | 92501-130800 | NUT | 3 |
| 35 | 70125-61090 | CONN.ROD CRANK PIN METL | 6 |
| 36 | 70125-61200 | CONN.ROD ASS'Y | 3 |
| 37 | 70125-61250 | CONN.ROD ASS'Y BOLT | 6 |
| 38 | 50135-61081 | CONN.ROD CRANK PIN METL | 3 |
| 39 | 70125-61070 | PISTON PIN SNAP RING | 6 |
| 40 | 70125-61120 | PISTON PIN | 3 |
| 41 | 70135-61010-1 | PISTON | 3 |
| 42 | 70135-61050 | OIL CONTROL RING | 6 |
| 43 | 70135-61030 | COMPRESSION RING | 6 |
| 44 | 70135-51011 | CYLINDER | 3 |
| 45 | 92501-131200 | NUT | 12 |
| 46 | 70135-11610 | CYL & HEAD PACKING | 3 |
| 47 | 91501-1312035 | BOLT | 18 |
| 48 | 70135-11011 | CYLINDER HEAD | 3 |
| 49 | 70125-11110 | I/O VALVE SEAT GASKET | 6 |
| 50 | 70125-31023 | INLET VALVE RECEIVER | 3 |

| ITEM NO. | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 51 | 70125-31070 | INLET VALVE SPRING | 3 |
| 52 | 70125-31030 | PLATE, INLET VALVE | 3 |
| 53 | 70125-31010 | INTER VALVE SEAT | 3 |
| 54 | 70125-31090 | I. VALVE UNLOAD FORK GUIDE | 3 |
| 55 | 70125-11230 | UNLOADING SPRING | 3 |
| 56 | 70125-31080 | I.VALVE UNLOAD FORK | 3 |
| 57 | 92517-231200 | SLOTTED NUT | 3 |
| 58 | 93601-810022A | O-RING P#22A | 3 |
| 59 | 70125-11220 | UNLOADING PISTON | 3 |
| 60 | 93602-810065 | O-RING G#65 | 3 |
| 61 | 70125-11151 | I. VALVE PUSH COVER | 3 |
| 62 | 91501-1310025 | BOLT | 24 |
| 63 | 90112-100101 | SCREW PLUG | 3 |
| 64 | 70124-41810 | BOLT | 3 |
| 65 | 70125-41012 | OUTLET VALVE SEAT | 3 |
| 66 | 701212A-41075 | OUTLET VALVE SPRING | 9 |
| 67 | 70125-41025 | OUTLET VALVE RECEIVR | 3 |
| 68 | 92501-231000 | NUT | 6 |
| 69 | 93602-870065 | VITON O-RING G#65 | 3 |
| 70 | 70125-11451 | O. VALVE PUSH COVER | 3 |
| 71 | 701312A1-87032 | DIST. MANIFOLD #C | 1 |
| 72 | 70135-87101 | COMP.BODY DIS. PIPING ASSEMBLY | 1 |
| 73 | 701312A1-87022 | DIST. MANIFOLD #B | 1 |
| 74 | 70135-87201 | COMP.BODY DIS. PIPING ASSEMBLY | 1 |
| 75 | 701312A2-87011 | DIST. MANIFOLD #A | 1 |
| 76 | 70125-41030 | PLATE, OUTLET VALVE | 3 |
| 77 | 70125-41001 | OUTLET, VALVE ASSY. | 3 |
| 78 | 70125-31000 | INLET, VALVE ASSY. | 3 |
| 79 | 70123-66001 | AIR STRAINER ASSY. | 3 |
| 80 | 70123-66140 | AIR STRAINER FILTER | 3 |

# MAIN PARTS LISTING FOR MODEL ES150B

| ITEM NO. | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 91501-1310025 | BOLT, M10 X 25 | 10 |
| 2 | 9252615-101000-0 | COPPER WASHER | 10 |
| 3 | 701310A1-57061 | REAR BEARING COVER | 1 |
| 4 | 70131B81-57670 | TUBE & BRTHR. ASSY. | 1 |
| 4a | 70131BA1-57670 | TUBE, BREATHER | 1 |
| 4b | CCC1697 | BREATHER, ASSY. | 1 |
| 5 | 701310A1-57590 | REAR COVER OIL BAFFLE | 1 |
| 6 | 701310A1-57070 | REAR BRG CVR GASKET | 1 |
| 7 | 70123-57190-4010 | CRANKCASE OIL CAP | 1 |
| 8 | 9151313-1105020-5202 | GAUGE SET BOLT | 4 |
| 9 | 701210A1-57740 | OIL GLASS & COVER | 1 |
| 9a | 701210A1-57700 | OIL COVER ASSY | 1 |
| 10 | 70124-57750 | OIL COVER GLASS | 1 |
| 11 | 701210A1-57730 | GAUGE COVER SEAL | 1 |
| 12 | 9156310-400800 | CRANKCASE OIL PLUG | 1 |
| 13 | 701312A3-57010 | CRANKCASE | 1 |
| 14 | 9354504-30310 | BEARING #30310 | 1 |
| 15 | 701312A1-56011 | CRANKSHAFT | 1 |
| 16 | 701312A1-56032 | CRANKSHAFT CTR. WGT. | 2 |
| 17 | 701312A1-56830 | CTR WGT LK WASHER | 2 |
| 18 | 701312A1-56811 | CTR WGT MGT BOLT | 2 |
| 19 | 701310A1-56060 | V-PULLEY KEY | 1 |
| 20 | 9354501-32210 | BEARING #32210 | 1 |
| 21 | 70135-57950 | FRONT BEARING GASKET | 1 |
| 22 | 701310A1-57080 | FRONT OIL SEAL | 1 |
| 23 | 701312A1-57030 | FRONT BEARING COVER | 1 |
| 24 | 701312A1-76011 | COMPRESSOR PULLEY | 1 |
| 25 | 70131283-76310 | COMP PULLEY FAN | 1 |
| 26 | 9253113-100800-8 | WASHER | 6 |
| 27 | 9150113-1108030-5202 | BOLT | 6 |
| 28 | 701210A1-76210 | PULLEY THRUST WASHER | 1 |
| 29 | 9253113-101200-8 | SPRING WASHER | 1 |
| 30 | 9150113-1112050-5608 | BOLT | 1 |
| 31 | 701312A1-51030 | CYL & CASE PACKING | 3 |
| 32 | 701312A1-51810 | CYL & CASE BOLT | 12 |
| 33 | 701312A1-61281 | OIL SPLASH DIPPER | 3 |
| 34 | 9250113-120800-538 | NUT | 3 |
| 35 | 701212A1-61090 | CONN.ROD CRANK PIN METL | 6 |
| 36 | 701212A1-61200 | CONN.ROD ASS'Y | 3 |
| 37 | 70125-61250 | CONN.ROD ASS'Y BOLT | 6 |
| 38 | 501312A1-61081 | CONN.ROD CRANK PIN METL | 3 |
| 39 | 701212A1-61070 | PISTON PIN SNAP RING | 6 |
| 40 | 701212A1-61120 | PISTON PIN | 3 |
| 41 | 701312A1-61010 | PISTON | 3 |
| 42 | 701212A1-61050 | OIL CONTROL RING | 6 |
| 43 | 701212A1-61030 | COMPRESSION RING | 6 |
| 44 | 701312A3-51010 | CYLINDER | 3 |
| 45 | 92501-131200 | NUT | 12 |
| 46 | 701312A3-11020 | CYL & HEAD GASKET | 3 |
| 47 | 9250113-121200-538 | BOLT | 12 |
| 48 | 701312A3-11010 | CYLINDER HEAD | 3 |
| 49 | 701212A1-11110 | I/O VALVE SEAT GASKET | 6 |
| | | | |
| | | | |
| | | | |

| ITEM NO. | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 50 | 701212A1-31023 | INLET VALVE RECEIVER | 3 |
| 51 | 701212A1-31070 | INLET VALVE SPRING | 3 |
| 52 | 501212A1-31030 | PLATE, INLET VALVE | 3 |
| 53 | 701212A1-31010 | INTER VALVE SEAT | 3 |
| 54 | 701212A1-31090 | I. VALVE UNLOAD FORK GUIDE | 3 |
| 55 | 701212A1-11230 | UNLOADING SPRING | 3 |
| 56 | 701212A1-31080 | I.VALVE UNLOAD FORK | 3 |
| 57 | 9250413-151200-532 | SLOTTED NUT | 3 |
| 58 | 9360187-350217 | O-RING P#22A | 3 |
| 59 | 701212A1-11220 | UNLOADING PISTON | 3 |
| 60 | 9360287-310644 | O-RING G#65 | 3 |
| 61 | 701212A1-11151 | I. VALVE PUSH COVER | 3 |
| 62 | 91501-1310025 | BOLT | 3 |
| 63 | 90112-100101 | SCREW PLUG | 24 |
| 64 | 70124-41810 | BOLT | 3 |
| 65 | 701212A1-41012 | OUTLET VALVE SEAT | 3 |
| 66 | 701212A1-41075 | OUTLET VALVE SPRING | 3 |
| 67 | 701212A1-41025 | OUTLET VALVE RECEIVR | 9 |
| 68 | 92501-231000 | NUT | 3 |
| 69 | 9360287-310644 | VITON O-RING G#65 | 6 |
| 70 | 701212A1-11451 | O. VALVE PUSH COVER | 3 |
| 71 | 701312A1-87032 | DIST. MANIFOLD #C | 3 |
| 72 | 70135-87101 | COMP.BODY DIS. PIPING ASSEMBLY | 1 |
| 73 | 701312A1-87022 | DIST. MANIFOLD #B | 1 |
| 74 | 701312A2-87100 | COMP.BODY DIS. PIPING ASSEMBLY | 1 |
| 75 | 701312A2-87011 | DIST. MANIFOLD #A | 1 |
| 76 | 70125-41030 | PLATE, OUTLET VALVE | 1 |
| 77 | 701212A1-41001 | OUTLET, VALVE ASSY. | 3 |
| 78 | 701212A1-31000 | INLET, VALVE ASSY. | 3 |
| 79 | 701312A1-66000 | AIR STRAINER ASSY. | 3 |
| 80 | 701208A1-66110 | AIR STRAINER FILTER | 3 |
| | | | 3 |
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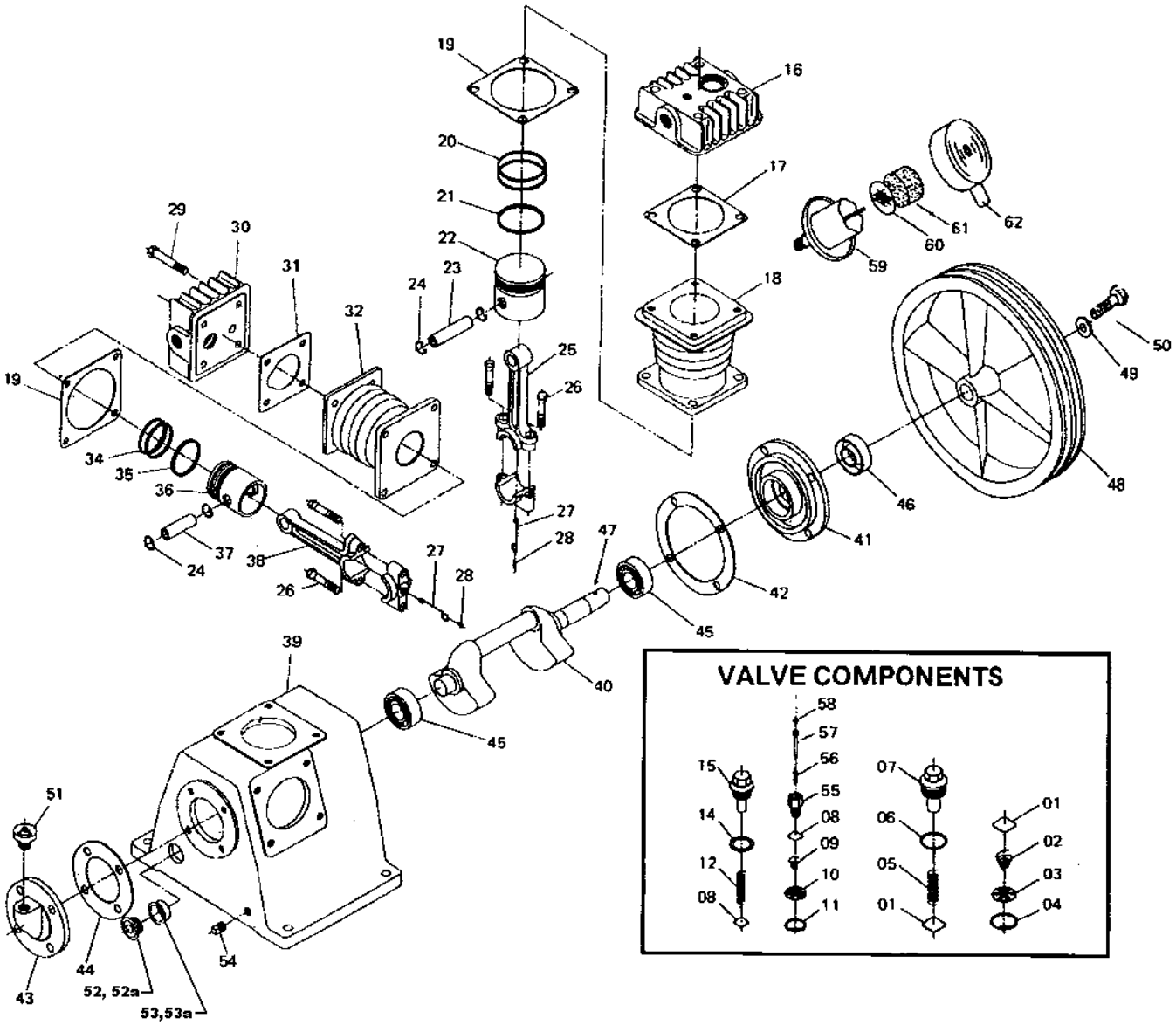
# AIR COOLED
# TWO STAGE MODELS E-11 & E-23

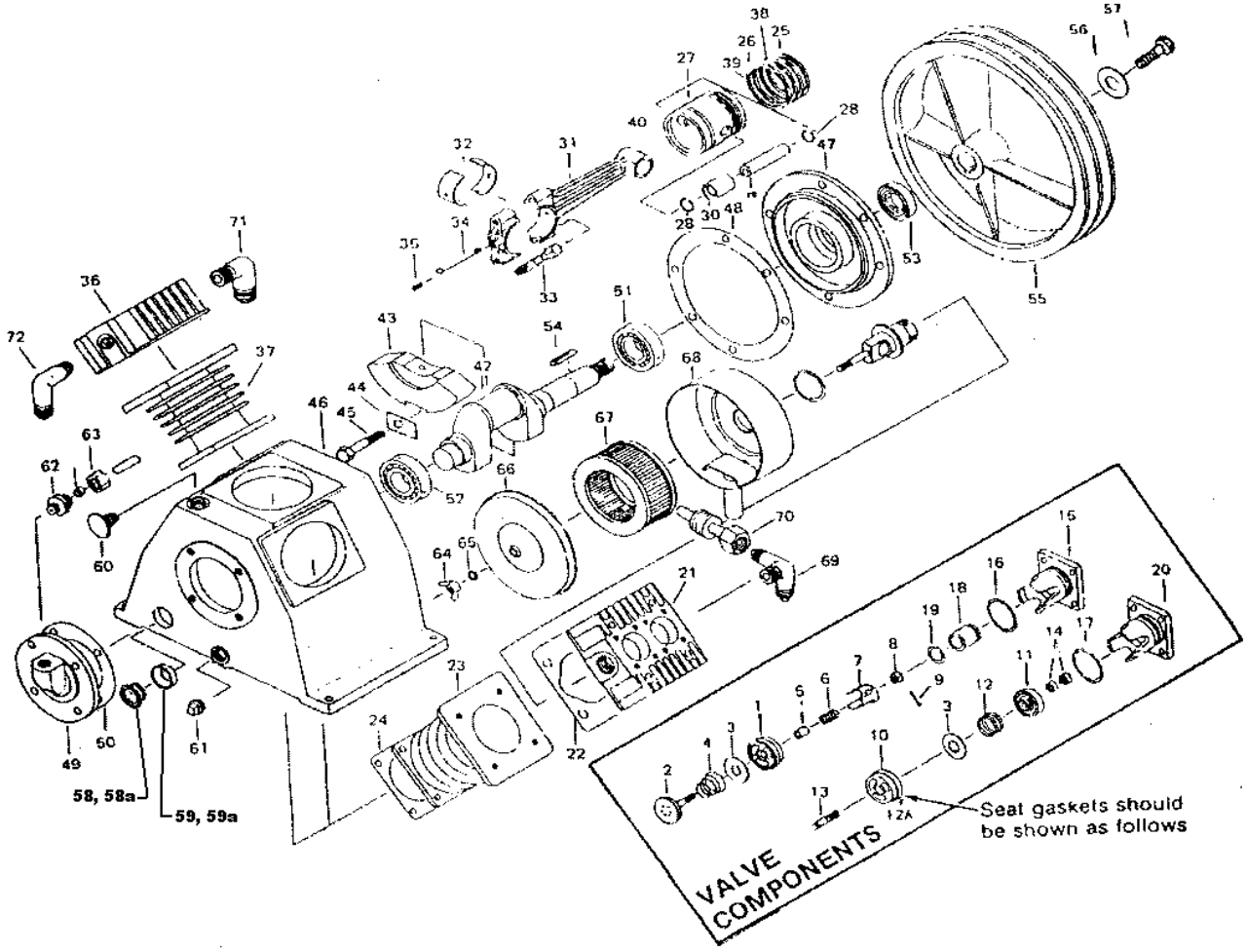


# MAIN PARTS LISTING FOR TWO STAGE MODELS E-11 & E-23

| | VALVES | Qty. Req. | MODEL E11 | Qty. Req. | MODEL E23 |
|---|---|---|---|---|---|
| 1. | Inlet & Outlet Valve Plate (1st) | 2 | 70112-31030 | 4 | 70112-31030 |
| 2. | Inlet Valve Spring (1st) | 1 | 70112-31070 | 2 | 70112-31070 |
| 3. | Inlet Valve Receiver (1st) | 1 | 70112-31020 | 2 | 70112-31020 |
| 4. | Inlet Valve Snap Ring (1st) | 1 | 93610-130232 | 2 | 93610-130232 |
| 5. | Outlet Valve Spring (1st) | 1 | 70112-41070 | 2 | 70112-41070 |
| 6. | Outlet Valve Push Cover Gasket (1st) | 1 | 70112-11461 | 2 | 70112-11461 |
| 7. | Outlet Valve Push Cover | 1 | 70112-11450 | 2 | 70112-11450 |
| 8. | Inlet & Outlet Valve Plate (2nd) | 2 | 70162-32030 | 2 | 70111-31030 |
| 9. | Inlet Valve Spring (2nd) | 1 | 70162-32070 | 2 | 70172-32070 |
| 10. | Inlet Valve Receiver (2nd) | 1 | 70162-32020 | 1 | 70111-31020 |
| 11. | Inlet Valve Snap Ring (2nd) | 1 | 93610-130222 | 1 | 93610-130225 |
| 12. | Outlet Valve Spring (2nd) | 1 | 70162-42070 | 1 | 70172-42070 |
| 14. | Outlet Valve Push Cover Gasket (2nd) | 1 | 70162-12650 | 1 | 70111-11461 |
| 15. | Outlet Valve Push Cover (2nd) | 1 | 70112-12450 | 1 | 70111-11450 |
| | **CYLINDERS** | | | | |
| 16. | Cylinder Head (1st) | 1 | 70112-11010 | 2 | 70112-11010 |
| 17. | Cylinder & Head Gasket (1st) | 1 | 70112-11612 | 2 | 70112-11612 |
| 18. | Cylinder (1st) | 1 | 70112-51010 | 2 | 70112-51010 |
| 19. | Cylinder & Case Gasket | 2 | 70112-51610 | 3 | 70112-51610 |
| 20. | Compression Ring (1st) | 2 | 70112-61030 | 4 | 70112-61030 |
| 21. | Oil Control Ring (1st) | 1 | 70112-61050 | 2 | 70112-61050 |
| 22. | Piston (1st) | 1 | 70112-61011 | 2 | 70112-61011 |
| 23. | Piston Pin (1st) | 1 | 70112-61120 | 2 | 70112-61120 |
| 24. | Piston Pin Snap Ring | 4 | 70112-61070 | 6 | 70112-61070 |
| 25. | Connecting Rod Assembly (1st) | 2 | 70112-61200-1 | 2 | 70112-61200-1 |
| 26. | Connecting Rod Bolt | 2 | 70112-61250 | 3 | 70112-61250 |
| 27. | Oil Splash Dipper | | 70122-61282 | 2 | 70122-61282 |
| 27A. | Oil Splash Dipper | | - | 1 | 70132-61290 |
| 28. | Oil Splash Dipper Bolt | 2 | 91507-2304010 | 3 | 91507-2304010 |
| 29. | Cylinder Head Bolt | 8 | 91501-1308025 | 12 | 91501-1308025 |
| 30. | Cylinder Head (2nd) | 1 | 70162-12010 | 1 | 70172-12010 |
| 31. | Cylinder & Head Gasket (2nd) | 1 | 70162-12610 | 1 | 70111-11612 |
| 32. | Cylinder (2nd) | 1 | 70162-52010 | 1 | 70172-52010 |
| 34. | Compression Ring (2nd) | 2 | 70162-62030 | 2 | 70111-61030 |
| 35. | Oil Control Ring (2nd) | 2 | 70162-62050 | 2 | 70111-61050 |
| 36. | Piston (2nd) | 1 | 70162-62010 | 1 | 70172-62010-1 |
| 37. | Piston Pin (2nd) | 1 | 70162-62120 | 1 | 70172-62120 |
| 38. | Connecting Rod Assembly (2nd) | | - | 1 | 70182-62200 |
| | **CRANK ASSEMBLY** | | | | |
| 39. | Crankcase | 1 | 70122-57010-4024 | 1 | 70132-57010-4024 |
| 40. | Crankshaft | 1 | 70122-56010 | 1 | 70132-56010 |
| 41. | Front Bearing Cover | 1 | 70122-57030 | 1 | 70122-57030 |
| 42. | Front Bearing Cover Gasket | 1 | 70122-57950 | 1 | 70122-57950 |
| 43. | Rear Bearing Cover | 1 | 70122-57060 | 1 | 70122-57060 |
| 44. | Rear Bearing Cover Gasket | 1 | 70122-57960 | 1 | 70122-57960 |
| 45. | Bearing | 2 | 93501-6205 | 2 | 93501-6205 |
| 46. | Front Oil Seal | 1 | 70122-57080 | 1 | 70122-57080 |
| 47. | V–Pulley Pin | 1 | 70112-56060 | 1 | 70112-56060 |
| 48. | Compressor Pulley | 1 | 70122-76011 | 1 | 70132-76010 |
| 49. | Compressor Pulley Thrust Washer | 1 | 70112-76210 | 1 | 70112-76210 |
| 50. | Compressor Pulley Thrust Bolt | 1 | 91501-1308025 | 1 | 91501-1308025 |
| 51. | Breather Assembly | 1 | CCC1375 | 1 | CCC1375 |
| 52. | Oil Gauge & Gauge Cover | 1 | 70111-57700 | 1 | 70111-57700 |
| 52*A. | Oil Level Gauge Assy. | 1 | 70704-57700 | 1 | 70704-57700 |
| 53. | Gauge Cover Seal | 1 | 70111-57730 | 1 | 70111-57730 |
| 53*A. | Oil Level Gauge “O” Ring | 1 | 93602-8126026 | 1 | 93602-8126026 |
| 54. | Crankcase Oil Plug | 1 | 90112-100202 | 1 | 90112-100202 |
| 54A. | Oil fill cap | | - | 1 | 70101-57190-4010 |
| 54B. | “O” Ring | | - | 1 | 93601-810016 |
| | **UNLOADERS** | | | | |
| 55. | Auto-Unloader Assembly | 2 | 70112-11201 | 3 | 70112-11201 |
| 56. | Auto-Unloader Spring | 2 | 70112-11230 | 3 | 70112-11230 |
| 57. | Auto-Unloader Piston | 2 | 70112-11221 | 3 | 70112-11221 |
| 58. | O-Ring (Unloader) | 2 | 93601-810016 | 3 | 93601-810016 |
| | **AIR STRAINER ASSEMBLY** | | | | |
| 61. | Air Strainer Filter | 1 | 70111-66141 | 2 | 70111-66141 |
| 63A. | Discharge Piping Assembly | | - | 1 | 70132-87100 |
| 63B. | Discharge Piping Assembly | 1 | 70172-87300 | 1 | 70172-87300 |
| 64. | Air Strainer Assembly | 1 | 70111-66001 | 2 | 70111-66001 |
| 65. | Outlet Pipe Joint #A | 2 | 70122-87010 | 3 | 70122-87010 |
| 65A. | Outlet Pipe Joint #B | | | 1 | 70132-87020 |

- E11, START S/N AS4040633
- E23, START S/N AS4030313

# AIR COOLED, TWO STAGE
# MODELS E-50 & E-71




| | DESCRIPTIONS | Qty. Req. | MODEL E50 | Qty. Req. | MODEL E71 |
|---|---|---|---|---|---|
| VALVE ASSEMBLIES | Inlet Valve Assembly, 1st Stage | 2 | 70123-31000 | 2 | 70124-31000 |
| | Inlet Valve Assembly, 2nd Stage | 1 | 70173-32000 | 1 | 70173-32000 |
| | Outlet Valve Assembly, 1st Stage | 2 | 70123-41000 | 2 | 70124-41000 |
| | Outlet Valve Assembly, 2nd Stage | 1 | 70123-41000 | 1 | 70123-41000 |
| | Air Strainer Assembly | 2 | 70123-66000 | 2 | 70123-66000 |
| | Breather Assembly | 1 | 70103-57600-4024 | 1 | 70124-57600-4010 |

## MAIN PARTS LISTING FOR TWO STAGE MODELS E-50 & E-71

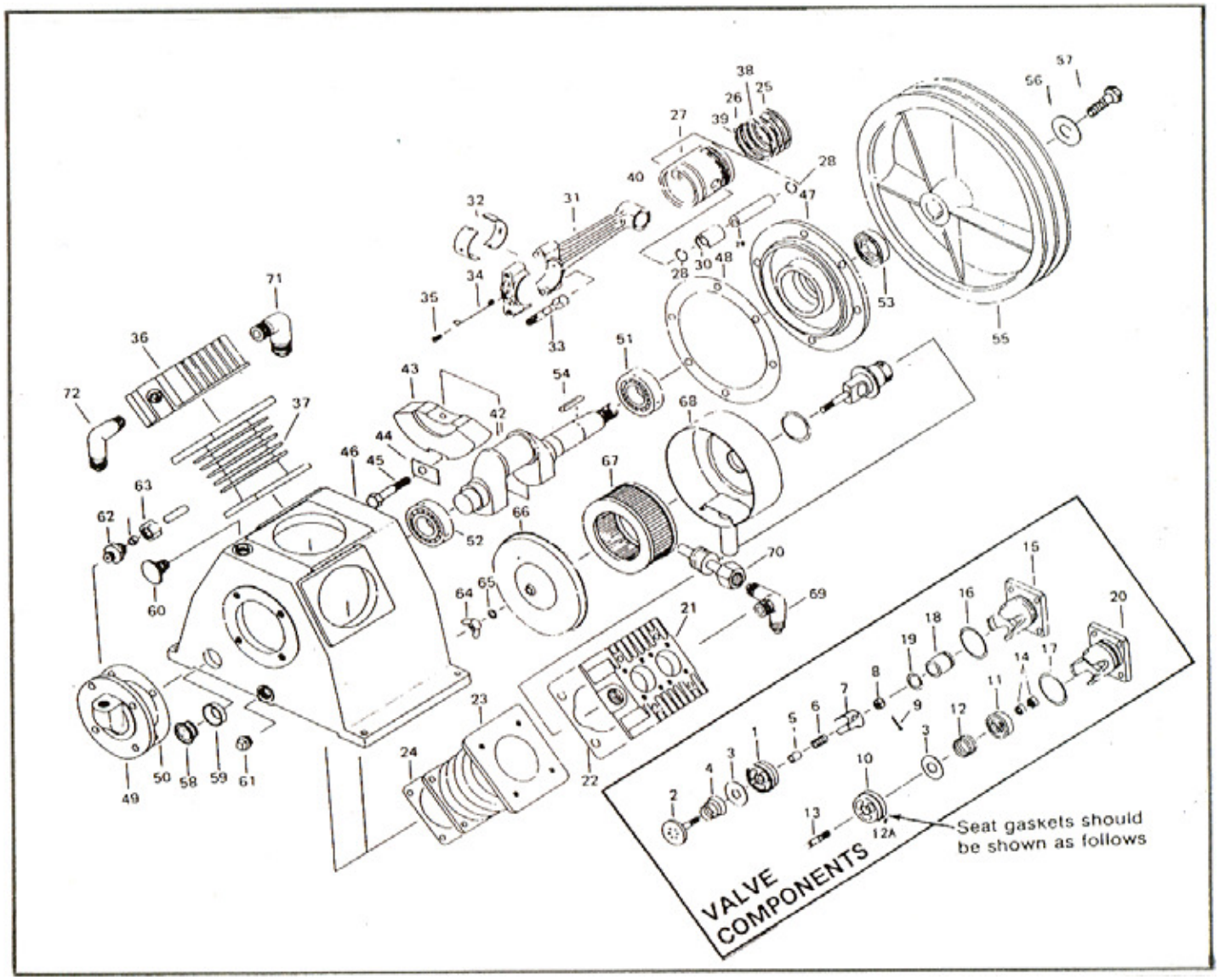
| | | DESCRIPTIONS | MODEL E50 | | | | MODEL E71 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Qty Req'd | 1st Stage | Qty Req'd | 2nd Stage | Qty Req'd | 1st Stage | Qty Req'd | 2nd Stage |
| VAVLES & UNLOADERS | 1. | Inlet Valve Seat | 2 | 70123-31010 | 1 | 70123-31010 | 2 | 70124-31010 | 1 | 70123-31010 |
| | 2. | Inlet Valve Receiver | 2 | 70123-31020 | 1 | 70123-31020 | 2 | 70124-31020 | 1 | 70123-31020 |
| | 3. | Inlet & Outlet Valve Plate | 4 | 70123-31030 | 2 | 70123-31030 | 4 | 70124-31030 | 2 | 70123-31030 |
| | 4. | Inlet Valve Spring | 2 | 70123-31070 | 1 | 70123-31070 | 2 | 70124-31070 | 1 | 70123-31070 |
| | 5. | Inlet Valve Unloading Fork Guide | 2 | 70123-31090 | 1 | 70123-31090 | 2 | 70124-31090 | 1 | 70123-31090 |
| | 6. | Unloading Spring | 2 | 70123-11230 | 1 | 70123-11230 | 2 | 70124-11230 | 1 | 70123-11230 |
| | 7. | Inlet Valve Unloading Fork | 2 | 70123-31080 | 1 | 70123-31080 | 2 | 70124-31080 | 1 | 70123-31080 |
| | 8. | Slotted Nut | 2 | 92502-230800 | 1 | 92502-230800 | 2 | 92502-230800 | 1 | 92502-230800 |
| | 9. | Cotter Pin | 2 | 93701-130220 | 1 | 93701-130220 | 2 | 93701-130220 | 1 | 93701-130220 |
| | 10. | Outlet Valve Seat | 2 | 70123-41011 | 1 | 70123-41011 | 2 | 70124-41011 | 1 | 70123-41011 |
| | 11. | Outlet Valve Receiver | 2 | 70123-41020 | 1 | 70123-41020 | 2 | 70124-41020 | 1 | 70123-41020 |
| | 12A. | Seat Gaskets | 4 | 70123-11110 | 2 | 70123-11110 | 4 | 70124-11110 | 2 | 70123-11110 |

# MAIN PARTS LISTING FOR TWO STAGE MODELS E-50 & E-71 (CONTINUED)

| | | | MODEL E-50 | | | | MODEL E-71 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DESCRIPTION | QTY | 1st Stage | QTY | 2nd Stage | QTY | 1st Stage | QTY | 2nd Stage |
| Valves & Unloaders | 12B | Outlet Valve Spring | 2 | 70123-41070 | 1 | 70123-41070 | 2 | 70124-41070 | 1 | 70123-41070 |
| | 13 | Outlet Valve Bolt | 2 | 70123-41810 | 1 | 70123-41810 | 2 | 70124-41810 | 1 | 70123-41810 |
| | 14 | Nut (Outlet Valve) | 2 | 92502-230800 | 1 | 92502-230800 | 2 | 92502-230800 | 1 | 92502-230800 |
| | 15 | Inlet Valve Push Cover | 2 | 70123-11150 | 1 | 70123-11150 | 2 | 70124-11150 | 1 | 70123-11150 |
| | 16 | O-ring G-40(Inlet Valve) | 2 | 93602-810040 | 1 | 93602-810040 | 2 | 93602-810055 | 1 | 93602-810055 |
| | 17 | Viton O-ring G-40 (Outlet Valve) | 2 | 93602-870040 | 1 | 93602-870040 | 2 | 93602-870055 | 1 | 93602-870040 |
| | 18 | Unloading Piston | 2 | 70123-11220 | 1 | 70123-11220 | 2 | 70124-11220 | 1 | 70123-11220 |
| | 19 | O-ring P-20 | 2 | 93601-810020 | 1 | 93601-870020 | 2 | 93601-810021 | 1 | 93601-870020 |
| | 20 | Outlet Valve Push Cover | 2 | 70123-11450 | 1 | 70123-11450 | 2 | 70124-11450 | 1 | 70123-11450 |
| Cylinders | 21 | Cylinder Head (1st) | 2 | 70123-11010 | | | 2 | 70124-11010 | | |
| | 22 | Cylinder & Head Gasket | 2 | 70123-11612 | 1 | 70123-11612 | 2 | 70124-11612 | 1 | 70123-11612 |
| | 23 | Cylinder (1st) | 2 | 70123-51012 | | | 2 | 70124-51011 | | |
| | 23A | S/N A311xxxx & Later Use | 2 | 70123-51012 | | | 2 | 70124-51011 | | |
| | 24 | Cylinder & Case Gasket | 2 | 70123-51610 | 1 | 70123-51610 | 2 | 70124-51610 | 1 | 70124-51610 |
| | 25 | Compression Ring (1st) | 4 | 70123-61030 | | | 4 | 70124-61030 | | |
| | 26 | Oil Control Ring (1st) | 4 | 70123-61050 | | | 4 | 70124-61050 | | |
| | 27 | Piston (1st) | 2 | 70123-61011 | | | 2 | 70124-61011-1 | | |
| | 27A | S/N 3020000 & Later Use | 2 | 70123-61011 | | | 2 | 70124-61011-1 | | |
| | 28 | Piston Snap Ring | 4 | 70123-61070 | 2 | 70123-61070 | 4 | 70124-61070 | 2 | 70124-61070 |
| | 29 | Piston Pin (1st) | 2 | 70123-61120 | | | 2 | 70124-61120 | | |
| | 30 | Con'cting Rod Pist. Pin Bushing | 2 | 70123-61081 | 1 | 70173-62080 | 2 | 70124-61080 | 1 | 70174-62081 |
| | 30A | Bushing S/N 3020000 & Later use | 2 | 70123-61081 | | | | | | |
| | 30B | Nedl Brg.S/N A303XXXX&LatrUse | | | | | | | 1 | 93503-RNA6903R |
| | 30C | Nedl Brg.(2nd)S/N A405XXXX&Latr | | | 1 | 93503-TA1725 | | | | |
| | 31 | Connecting Rod Assy | 2 | 70123-61200 | 1 | 70173-62200 | 2 | 70124-61201 | 1 | 70174-62202 |
| | 31B | Conn. Rod Assy., 2nd Stage S/N A405XXXX & Later Use | | | 1 | 70173-62200 | | | | |
| | 32 | Connecting Rod Crank Pin Metal | 4 | 70123-61090 | 2 | 70123-61090 | 4 | 70124-61090 | 2 | 70124-61090 |
| | 33 | Connecting Rod Bolt | 4 | 70125-61250 | 2 | 70125-61250 | 4 | 70125-61250 | 2 | 70125-61250 |
| | 34 | Oil Splash Dipper | 2 | 70122-61282 | 1 | 70132-61290 | 2 | 70134-61281 | 1 | 70134-61290 |
| | 35 | Oil Splash Dipper Bolt | 2 | 91507-2304012 | 1 | 91507-2304012 | 2 | 91507-2304012 | 1 | 91507-2304012 |
| | 36 | Cylinder Head (2nd) | | | 1 | 70123-11010 | | | 1 | 70174-12010 |
| | 37 | Cylinder (2nd) | | | 1 | 70173-52010 | | | 1 | 70174-52011 |
| | 37A | Cyl (2nd),S/N 3020000 & Later Use | | | | | | | 1 | 70174-52011 |
| | 38 | Compression Ring (2nd) | | | 3 | 70112-61030 | | | 3 | 70123-61030 |
| | 39 | Oil Control Ring (2nd) | | | 1 | 70112-61050 | | | 2 | 70123-61050 |
| | 40 | Piston (2nd) | | | 1 | 70173-62010-1 | | | 1 | 70174-62010-1 |
| | 41 | Piston Pin (2nd) | | | 1 | 70173-62120 | | | 1 | 70174-62120 |
| Crankcase & Crank Assembly | 42 | Crankshaft | 1 | 70133-56011 | | | 1 | 70134-56010 | | |
| | 43 | Crankshaft | | - | | | 1 | 70134-56030 | | |
| | 44 | Counterweight Lock Washer | | - | | | 2 | 70124-56830 | | |
| | 45 | Counterweight Mtg. Bolt | | - | | | 2 | 70124-56810 | | |
| | 46 | Crankcase | 1 | 70133-57010-4024 | | | 1 | 70134-57010-4024 | | |
| | 47 | Front Bearing Cover | 1 | 70133-57030 | | | 1 | 70134-57030 | | |
| | 48 | Front Bearing Cover Gasket | 1 | 70123-57950 | | | 1 | 70124-57950 | | |
| | 49 | Rear Bearing Cover | 1 | 70133-57061 | | | 1 | 70134-57061 | | |
| | 49A | Rear Brg Cvr, S/N 3020000 & Latr | 1 | 70133-57061 | | | 1 | 70134-57061 | | |
| | 50 | Rear Brg Cvr Gasket | 1 | 70133-57960 | | | 1 | 70134-57960 | | |
| | 51 | Front Bearing | 1 | 93501-6306 | | | 1 | 93502-32210 | | |
| | 52 | Rear Bearing | 1 | 93501-6306 | | | 1 | 93502-32210 | | |
| | 53 | Front Oil Seal | 1 | 70123-57080 | | | 1 | 70134-57080 | | |
| | 54 | V-Pulley Pin | 1 | 70123-56061 | | | 1 | 70134-56060 | | |
| | 55A | Compressor Fan | | - | | | 1 | 70124-76310 | | |
| | 55B | Compressor Pulley | 1 | 70133-76010 | | | 1 | 70134-76011 | | |
| | 56 | Compressor Pulley Washer | 1 | 92521-232000 | | | 1 | 70124-76210 | | |
| | 57 | Compressor Pulley Set Bolt | 1 | 91501-1312030 | | | 1 | 91501-1312040 | | |
| | 58 | Gauge Cover | 1 | 70111-57700 | | | 1 | 70124-57700 | | |
| | 58*A | Oil Level Gauge Assy. | 1 | 70704-57700 | | | | - | | |
| | 59 | Gauge Cover Seal | 1 | 70111-57730 | | | 1 | 70124-57730 | | |
| | 59*A | Oil Level Gauge "O" Ring | 1 | 93602-8126026 | | | | - | | |
| | 60 | Crankcase Oil Cap | 1 | CCC1257 | | | 1 | CCC1257 | | |
| | 61 | Crankcase Oil Plug | 1 | 90112-100404 | | | 1 | 90112-100404 | | |
| | 62 | Breather Assembly | 1 | CCC1375 | | | 1 | CCC1258 | | |
| | 67 | Air Strainer Filter | 2 | 70123-66140 | | | 2 | 70123-66140 | | |
| | 69 | Outlet Pipe Joint B | 1 | 70123-87020 | | | 1 | 70174-87020 | | |
| | 70A | Comp.body.discharg.pipe.assy. 1st | 1 | 70133-87101 short | | | 1 | 70134-87101 short | | |
| | 70B | Comp.body.discharg.pipe.assy. 1st | | - | | | | - | | |
| | 70C | Comp.body.discharg.pipe.assy.2nd | | - | | | | - | | |
| | 70D | Comp.body.discharg.pipe.assy.2nd | 1 | 70173-87300 long | | | 1 | 70174-87300 long | | |
| | 71 | Outlet Pipe Joint A | 2 | 70123-87010 | | | 3 | 70124-87010 | | |
| | 72 | Outlet Pipe Joint D | 1 | 70173-87010 | | | | | | |
| | 73 | Outlet Pipe Joint C | | | | | | | | |
| | 74 | Gasket Manifold | | - | | | | - | | |

*E 50, START S/N AS4030343

# AIR COOLED, TWO STAGE
# MODEL E-15




| | Description | Qty. Req. | MODEL E15 |
|---|---|---|---|
| VALVE ASSEMBLIES | Inlet Valve Assembly, 1st Stage | 2 | 70125-31000 |
| | Inlet Valve Assembly, 2nd Stage | 1 | 70175-32000 |
| | Outlet Valve Assembly, 1st Stage | 2 | 70125-41000 |
| | Outlet Valve Assembly, 2nd Stage | 1 | 70175-42000 |
| | Air Strainer Assembly | 2 | 70123-66000 |
| | Breather Assembly | 1 | 70124-57600-4010 |

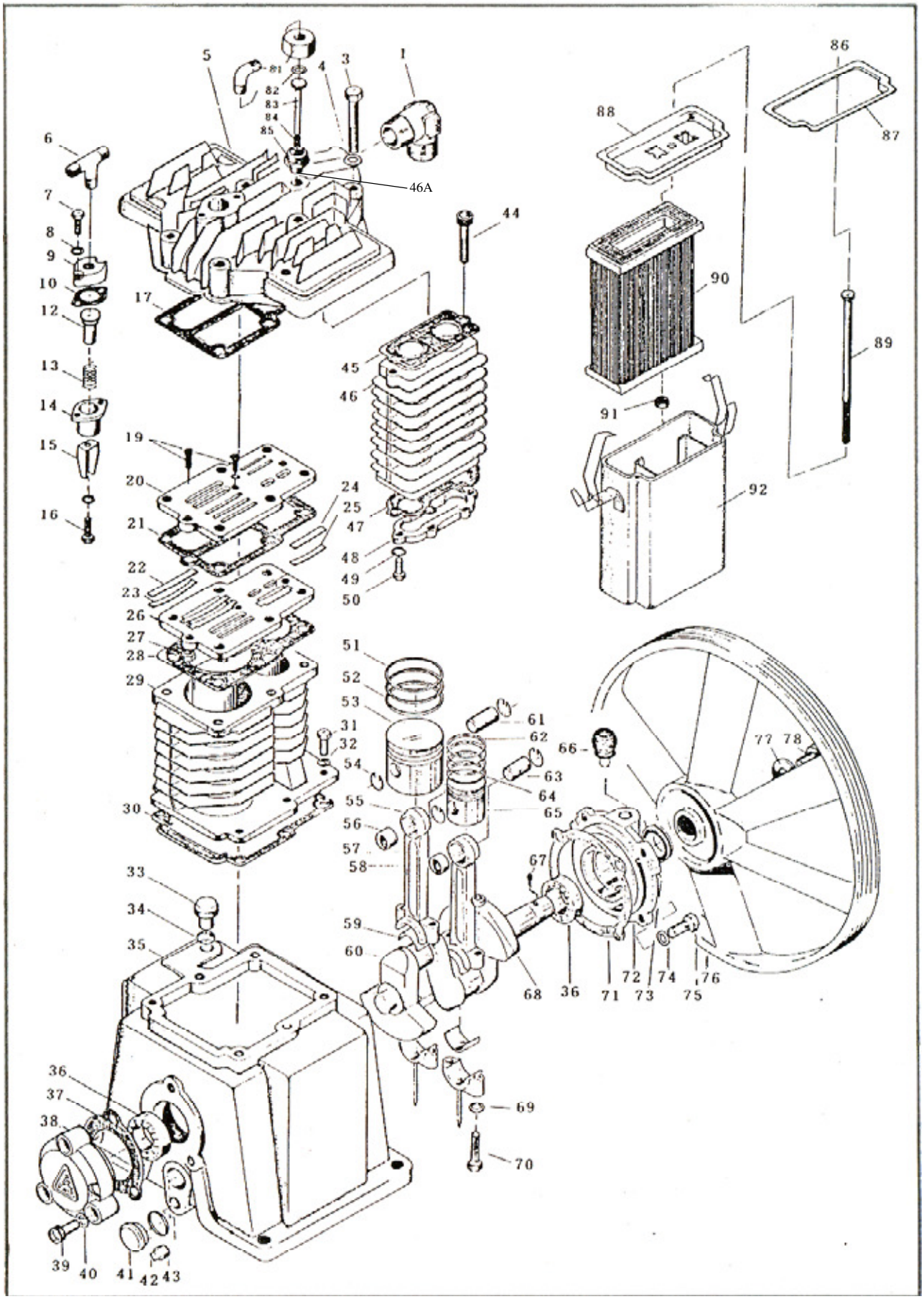
## MAIN PARTS LISTING FOR TWO STAGE MODEL E-15

| | | Description | MODEL E15 | | | |
|---|---|---|---|---|---|---|
| | | | Qty Req'd | 1st Stage | Qty Req'd | 2nd Stage |
| VAVLES & UNLOADERS | 1. | Inlet Valve Seat | 2 | 70125-31010 | 1 | 70124-31010 |
| | 2. | Inlet Valve Receiver | 2 | 70125-31022 | 1 | 70124-31020 |
| | 3. | Inlet & Outlet Valve Plate | 4 | 70125-31030 | 2 | 70175-42030 |
| | 4. | Inlet Valve Spring | 2 | 70125-31070 | 1 | 70124-31070 |
| | 5. | Inlet Valve Unloading Fork Guide | 2 | 70125-31090 | 1 | 70124-31090 |
| | 6. | Unloading Spring | 2 | 70125-11230 | 1 | 70124-11230 |
| | 7. | Inlet Valve Unloading Fork | 2 | 70125-31080 | 1 | 70124-31080 |
| | 8. | Slotted Nut | 2 | 92502-230800 | 1 | 92502-230800 |
| | 9. | Cotter Pin | 2 | 93701-130220 | 1 | 93701-130220 |
| | 10. | Outlet Valve Seat | 2 | 70125-41011 | 1 | 70124-41010 |
| | 11. | Outlet Valve Receiver | 2 | 70125-41021 | 1 | 70175-42020 |
| | 12A. | Seat Gaskets | 4 | 70125-11110 | 2 | 70124-11110 |

# MAIN PARTS LISTING FOR TWO STAGE MODEL E-15 (Continued)

| | | DESCRIPTION | MODEL E15 | | | |
|---|---|---|---|---|---|---|
| | | | Qty Req'd | 1st Stage | Qty Req'd | 2nd Stage |
| VALVES & UNLOADERS | 12B. | Outlet Valve Spring | 2 | 70125-41071 | 1 | 70124-41072 |
| | 13. | Outlet Valve Bolt | 2 | 70124-41810 | 1 | 70124-41810 |
| | 14. | Nut (Outlet Valve) | 2 | 92501-231000 | 1 | 92501-231000 |
| | 15. | Inlet Valve Push Cover | 2 | 70125-11151 | 1 | 70175-12150 |
| | 16. | O-Ring G-65 (Inlet Valve) | 2 | 93602-810065 | 1 | 93602-870055 |
| | 17. | Viton O-Ring G-65 (Outlet Valve) | 2 | 93602-870065 | 1 | 93602-870055 |
| | 18. | Unloading Piston | 2 | 70125-11220 | 1 | 70124-11220 |
| | 19. | O-Ring P-20 | 2 | 93601-810022A | 1 | 93601-870021 |
| | 20. | Outlet Valve Push Cover | 2 | 70125-11451 | 1 | 70175-12450 |
| | 20A. | Outlet Valve Push Cover Push Pipe | 1 | 70124-11120 | | |
| CYLINDERS | 21. | Cylinder Head (1st) | 2 | 70125-11010 | | |
| | 21A. | S/N A31XXXX & Later Use | 2 | 70135-11010 | | |
| | 22. | Cylinder & Head Gasket | 2 | 70125-11612 | 1 | 70124-11612 |
| | 22A. | S/N A311XXXX & Later Use | 2 | 70135-11612 | | |
| | 23. | Cylinder (1st) | 2 | 70125-51010 | | |
| | 23A. | S/N A311xxxx & Later Use | 2 | 70135-51011 | | |
| | 24. | Cylinder & Case Gasket | 2 | 70135-51610 | | |
| | 25. | Compression Ring (1st) | 4 | 70125-61030 | | |
| | 26. | Oil Control Ring (1st) | 4 | 70125-61050 | | |
| | 27. | Piston (1st) | 2 | 70135-61010-1 | | |
| | 27A. | S/N 3020000 & Later Use | 2 | 70135-61010-1 | | |
| | 28. | Piston Snap Ring | 4 | 70125-61070 | 2 | 70125-61070 |
| | 29. | Piston Pin (1st) | 2 | 70125-61120 | | |
| | 30. | Connecting Rod Piston Pin Bushing (1st) | 2 | 70125-61081 | 1 | 70175-62080 |
| | 30D. | Needle Bearing (2nd) S/N A409XXXX & Later Use | | | 1 | 93503-NK28/30 |
| | 31. | Connecting Rod Assembly, 1st Stage | 2 | 70125-61200 | 1 | 70175-61200 |
| | 31C. | Connecting Rod Assembly, 2nd Stage | | | 1 | 70175-62201 |
| | 32. | Connecting Rod Crank Pin Metal | 4 | 70125-61090 | 2 | 70125-61090 |
| | 33. | Connecting Rod Bolt | 4 | 70125-61250 | 2 | 70125-61250 |
| | 34. | Oil Splash Dipper | 2 | 70135-61281 | 1 | 70135-61281 |
| | 35. | Oil Splash Dipper Bolt | 2 | 92501-130800 | 1 | 92501-130800 |
| | 36. | Cylinder Head (2nd) | | | 1 | 70175-12010 |
| | 37. | Cylinder (2nd) | | | 1 | 70175-52010 |
| | 38. | Compression Ring (2nd) | | | 3 | 70124-61030 |
| | 39. | Oil Control Ring (2nd) | | | 2 | 70124-61050 |
| | 40. | Piston (2nd) | | | 1 | 70175-62010-1 |
| | 40A. | Piston (2nd), S/N A409XXXX & Later Use | | | 1 | 70175-62011-1 |
| | 41. | Piston Pin (2nd) | | | 1 | 70175-62121 |
| | 41A. | Piston Pin (2nd), S/N A409XXXX & Later Use | | | 1 | 70175-62121 |
| CRANKCASE AND CRANK ASSEMBLY | 42. | Crankshaft | 1 | 70135-56011 | | |
| | 43. | Crankshaft Counterweight | 1 | 70135-56030 | | |
| | 44. | Counterweight Lock Washer | 2 | 70124-56830 | | |
| | 45. | Counterweight Mounting Bolt | 2 | 70135-56811 | | |
| | 46. | Crankcase | 1 | 70135-57010-4024 | | |
| | 47. | Front Bearing Cover | 1 | 70135-57030 | | |
| | 48. | Front Bearing Cover Gasket | 1 | 70135-57950 | | |
| | 49. | Rear Bearing Cover | 1 | 70134-57061 | | |
| | 49A. | Rear Bearing Cover, S/N 3020000 & Later Use | 1 | 70134-57061 | | |
| | 50. | Rear Bearing Cover Gasket | 1 | 70134-57960 | | |
| | 51. | Front Bearing | 1 | 93502-30310 | | |
| | 52. | Rear Bearing | 1 | 93502-32210 | | |
| | 53. | Front Oil Seal | 1 | 70134-57080 | | |
| | 54. | V-Pulley Pin | 1 | 70134-56060 | | |
| | 55A. | Compressor Fan | 1 | 70135-76310 | | |
| | 55B. | Compressor Pulley | 1 | 70135-76011 | | |
| | 56. | Compressor Pulley Washer | 1 | 70135-76210 | | |
| | 57. | Compressor Pulley Set Bolt | 1 | 91501-1312050 | | |
| | 58. | Gauge Cover | 1 | 70124-57700 | | |
| | 59. | Gauge Cover Seal | 1 | 70124-57730 | | |
| | 60. | Crankcase Oil Cap | 1 | CCC1257 | | |
| | 61. | Crankcase Oil Plug | 1 | 90112-100404 | | |
| | 62. | Breather Assembly | 1 | 70124-57600-4010 | | |
| | 67. | Air Strainer Filter | 2 | 70123-66140 | | |
| | 69. | Outlet Pipe Joint B | 1 | 70175-87021 | | |
| | 70A. | Compressor Body Discharge Piping Assembly, 1st | 1 | 70135-87100(long) | | |
| | 70B. | Compressor Body Discharge Piping Assembly, 1st | 1 | 70135-87200(short) | | |
| | 70C. | Compressor Body Discharge Piping Assembly, 2nd | 1 | 70175-87400(short) | | |
| | 70D. | Compressor Body Discharge Piping Assembly, 2nd | 1 | 70175-87300(long) | | |
| | 71. | Outlet Pipe Joint A | 1 | 70175-87010 | | |
| | 72. | Outlet Pipe Joint D | 1 | 70125-87020 | | |
| | 73. | Outlet Pipe Joint C | 1 | 70175-87030-4010 | | |
| | 74. | Gasket Manifold | 4 | 70125-87510 | | |

# AIR COOLED TWO STAGE MODEL E-35



# MAIN PARTS LISTING FOR AIR COOLED TWO STAGE MODEL E-35

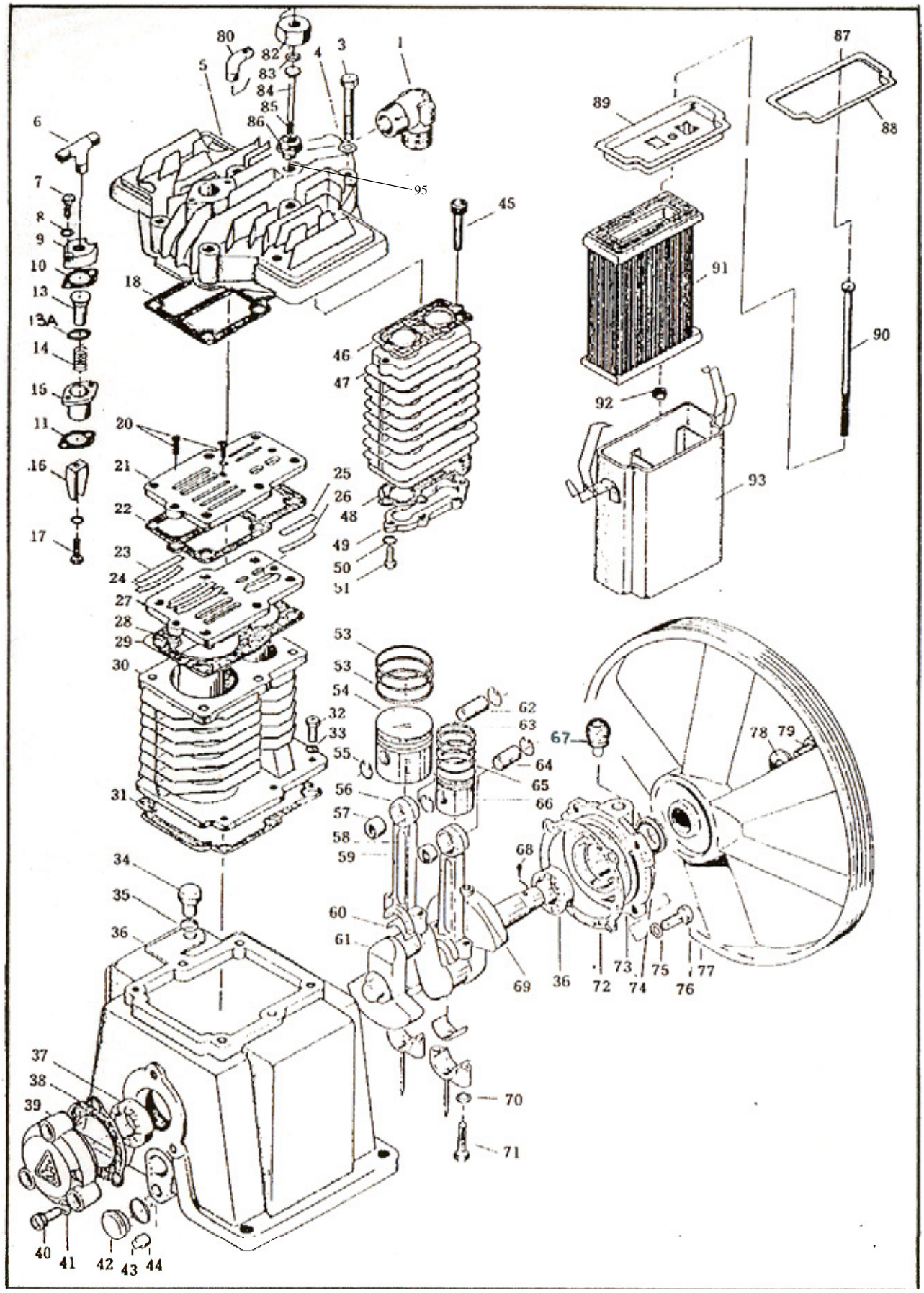
(FORMERLY B-1)

| | DESCRIPTION | QTY | PART NO. |
|---|---|---|---|
| 1. | Discharge Elbow | 1 | 70123-87050 |
| 2. | Discharge Elbow Nut (Not Shown) | 1 | 79922-130606 |
| 3. | Cylinder Head Bolt | 6 | 91501-1310085 |
| 4. | Spring Washer | 6 | 92522-130800 |
| 5. | Cylinder Head | 1 | 70152-11010 |
| 6. | Unloading Tee * # | 1 | 79922-150101 |
| 7. | Bolt | 2 | 91521-1306025 |
| 8. | Spring Washer | 2 | 92522-130600 |
| 9. | Upper Cover | 1 | 70153-11270 |
| 10. | Upper Cover Gasket | 1 | 70153-11641 |
| 11. | Unloader Assembly (1st)(Includes 12-16) | 1 | 70152-11201 |
| 12. | Unloading Piston | 1 | 70153-11222 |
| 13. | Unloading Spring | 1 | 70153-11231 |
| 14. | Unloading Cylinder | 1 | 70153-11211 |
| 15. | Unloading Fork (1st) | 1 | 70152-31080 |
| 16. | Bolt | 1 | 91501-1306015 |
| 17. | Cylinder Head Valve Seat Gasket | 1 | 70152-11612 |
| 18. | Valve Plate Assembly (Includes 19-27) | 1 | 70152-31000 |
| 19. | Valve Seat Bolt | 3 | 91521-1305012 |
| 20. | Valve Seat (Upper) | 1 | 70152-31010 |
| 21. | Valve Seat Gasket | 1 | 70152-31120 |
| 22. | Valve Plate (1st) | 4 | 70152-31030 |
| 23. | Valve Plate Spring (1st) | 4 | 70152-31070 |
| 24. | Valve Plate (2nd) | 2 | 70152-32030 |
| 25. | Valve Plate Spring (2nd) | 2 | 70152-32070 |
| 26. | Valve Seat (Bottom) | 1 | 70152-31020 |
| 27. | Nut | 1 | 92501-230500 |
| 28. | Cylinder-Valve Seat Gasket | 1 | 70152-11622 |
| 29. | Cylinder | 1 | 70152-51010 |
| 30. | Cylinder Crankcase Gasket | 1 | 70152-51610 |
| 31. | Bolt | 11 | 91501-1310030 |
| 32. | Copper Washer | 6 | 92521-190800 |
| 33. | Crankcase Oil Cap | 1 | 70101-57190-4010 |
| 34. | Oil Cap O-Ring | 1 | 93601-810016 |
| 35. | Crankcase | 1 | 70152-57010 |
| 36. | Bearing #6025 (Front & Rear) | 2 | 93501-6205 |
| 37. | Rear Cover Gasket | 1 | 70152-57960 |
| 38. | Rear Cover | 1 | 70152-57060 |
| 39. | Rear Cover Bolt | 3 | 91521-1308030 |
| 40. | Copper Washer | 7 | 92521-190800 |
| 41. | Oil Level Gauge & Gauge Cover | 1 | 70111-57700 |
| 42. | Gauge Cover Seal | 1 | 70111-57730 |
| 43. | Crankcase Oil Plug (1/4" NPT) | 1 | 90112-100303 |
| 44. | Inter-Cooler Bolt | 3 | 91521-1308050 |
| 45. | Gasket | 1 | 70152-71612 |
| 46. | Inter-Cooler Body | 1 | 70152-71110 |
| 46A. | Gasket, Copper | 1 | 70152-12280 |

| | DESCRIPTION | QTY | PART NO. |
|---|---|---|---|
| 47. | Inter-Cooler Body Gasket | 1 | 70152-71622 |
| 48. | Inter-Cooler Cover | 1 | 70152-71160 |
| 49. | Spring Washer | 4 | 92522-130600 |
| 50. | Bolt | 4 | 91501-1306016 |
| 51. | Compression Ring (1st) | 2 | 70152-61030 |
| 52. | Oil Control Ring (1st) | 1 | 70152-61050 |
| 53. | Piston (1st) | 1 | 70152-61010 |
| 54. | Piston Snap Ring | 4 | 70152-61070 |
| 55. | Connection Rod Assembly (1st) | 1 | 70152-61200 |
| 56. | Piston Pin Bush (1st) | 1 | 70152-61080 |
| 57. | Connecting Rod Assembly (2nd) | 1 | 70152-62200 |
| 58. | Piston Pin Bush (2nd) | 1 | 70152-62080 |
| 59. | Crank Pin Metal (Rod Bearing 2 Halves) | 2 | 70152-61090 |
| 60. | Crankshaft | 1 | 70152-56010 |
| 61. | Piston Pin (1st) | 1 | 70152-61120 |
| 62. | Compression Ring (2nd) | 3 | 70152-62030 |
| 63. | Piston Pin (2nd) | 1 | 70152-62120 |
| 64. | Oil Control Ring (2nd) | 1 | 70152-62050 |
| 65. | Piston (2nd) | 1 | 70152-62010 |
| 66. | Breather Assembly | 1 | CCC1375 |
| 67. | V-Pulley Pin | 1 | 70112-56060 |
| 68. | Nut (Connecting Rod) | 4 | 92501-130800 |
| 69. | Spring Washer (Connecting Rod) | 4 | 92522-130800 |
| 70. | Bolt (Connecting Rod) | 4 | 70152-61250 |
| 71. | Front Cover Gasket | 1 | 70152-57950 |
| 72. | Front Cover | 1 | 70152-57030 |
| 73. | Front Oil Seal | 1 | 70127-57080 |
| 74. | Copper Washer | 7 | 92521-190800 |
| 75. | Bolt | 4 | 91501-1310030 |
| 76. | Compressor Pulley | 1 | 70152-76010 |
| 77. | Compressor Pulley Thrust Washer | 1 | 70112-76210 |
| 78. | Bolt | 1 | 91501-1308025 |
| 79. | Unloading Elbow * # | 1 | 79926-150101 |
| 80. | Unloader Assembly (2nd)(Includes 81-85) | 1 | 70152-12200 |
| 81. | Unloader Cover (2nd) | 1 | 70103-11271 |
| 82. | Viton O-Ring Unloader (2nd) | 1 | 93601-870009 |
| 83. | Unloading Piston (2nd) | 1 | 70152-12221 |
| 84. | Unloading Spring (2nd) | 1 | 70103-11230 |
| 85. | Unloader Body | 1 | 70153-12200 |
| 86. | Air Strainer Assembly (Includes 87-92) | 1 | 70152-66001 |
| 87. | Air Strainer Cover Gasket | 1 | 70152-66131 |
| 88. | Air Strainer Cover | 1 | 70153-66120 |
| 89. | Air Strainer Bolt | 1 | 70152-66160 |
| 90. | Air Strainer Element | 1 | 70152-66141 |
| 91. | Nut (Self Lock) Air Strainer | 1 | 92522-230600 |
| 92. | Air Strainer Body | 1 | 70152-66011 |
| 93. | Intercooler Safety Valve (Not Shown) | 1 | VV431 |

* Includes Nut(S) And Sleeve(S) # Not Supplied On Basics

# AIR COOLED TWO STAGE MODEL E-57



# MAIN PARTS LISTING FOR AIR COOLED TWO STAGE MODEL E-57

(FORMERLY B-2)

| | DESCRIPTION | QTY | PART NO. |
|---|---|---|---|
| 1. | Discharge Elbow | 1 | 701210A1-87011 |
| 2. | Discharge Elbow Nut (Not Shown) | 1 | 79922-130707 |
| 3. | Cylinder Head Bolt | 6 | 91501-1310085 |
| 4. | Spring Washer | 6 | 92522-131000 |
| 5. | Cylinder Head | 1 | 70153-11011 |
| 6. | Unloading Tee * # | 1 | 90126-150101 |
| 7. | Bolt | 2 | 91521-1306025 |
| 8. | Spring Washer | 2 | 92522-130600 |
| 9. | Upper Cover | 1 | 70153-11270 |
| 10. | Upper Cover Gasket | 1 | 70153-11631 |
| 11. | Lower Unloader Gasket | 1 | 70153-11641 |
| 12. | Unloader Assembly (1st)(Includes 13-17) | 1 | 70153-11201 |
| 13. | Unloading Piston | 1 | 70153-11222 |
| 13A. | Viton O-Ring Unloader (1ST) | 1 | 93601-870015 |
| 14. | Unloading Spring | 1 | 70153-11231 |
| 15. | Unloading Cylinder | 1 | 70153-11211 |
| 16. | Unloading Fork | 1 | 70153-31080 |
| 17. | Bolt | 1 | 91501-1306016 |
| 18. | Cylinder Head Valve Seat Gasket | 1 | 70153-11612 |
| 19. | Valve Plate Assembly (Includes 20-28) | 1 | 70153-31001 |
| 20. | Valve Seat Bolt | 3 | 91521-1305012 |
| 21. | Valve Seat (Upper) | 1 | 70153-31011 |
| 22. | Valve Seat Gasket | 1 | 70153-31120 |
| 23. | Valve Plate (1st) | 4 | 70153-31032 |
| 24. | Valve Plate Spring (1st) | 4 | 70153-31072 |
| 25. | Valve Plate (2nd) | 2 | 70153-32032 |
| 26. | Valve Plate Spring (2nd) | 2 | 70153-32072 |
| 27. | Valve Seat (Bottom) | 1 | 70153-31021 |
| 28. | Nut | 2 | 92501-230500 |
| 29. | Cylinder-Valve Seat Gasket | 1 | 70153-11622 |
| 30. | Cylinder | 1 | 70153-51011 |
| 31. | Cylinder Crankcase Gasket | 1 | 70153-51611 |
| 32. | Bolt | 6 | 91501-1310030 |
| 33. | Copper Washer | 6 | 92521-191000 |
| 34. | Crankcase Oil Cap | 1 | CCC1257 |
| 35. | Oil Cap O-Ring | 1 | 93601-810018 |
| 36. | Crankcase | 1 | 70153-57011 |
| 37. | Bearing #6026 (Front & Rear) | 2 | 93501-6206 |
| 38. | Rear Cover Gasket | 1 | 70153-57961 |
| 39. | Rear Cover | 1 | 70153-57061 |
| 40. | Rear Cover Bolt | 3 | 91521-1308030 |
| 41. | Copper Washer | 3 | 92521-190800 |
| 42. | Oil Level Gauge & Gauge Cover | 1 | 70111-57700 |
| 43. | Gauge Cover Seal | 1 | 70111-57730 |
| 44. | Crankcase Oil Plug (1/4" NPT) | 1 | 70153-12350 |
| 45. | Inter-Cooler Bolt | 3 | 91521-1308055 |
| 46. | Gasket | 1 | 70153-71611 |
| 47. | Inter-Cooler Body | 1 | 70153-71111 |
| 48. | Inter-Cooler Body Gasket | 1 | 70153-71622 |

| | DESCRIPTION | QTY | PART NO. |
|---|---|---|---|
| 49. | Inter-Cooler Cover | 1 | 70153-71161 |
| 50. | Spring Washer | 6 | 92522-130600 |
| 51. | Bolt | 6 | 91501-1306016 |
| 52. | Compression Ring (1st) | 2 | 70124-61030 |
| 53. | Oil Control Ring (1st) | 2 | 70124-61050 |
| 54. | Piston (1st) | 1 | 70153-61011 |
| 55. | Piston Pin Snap Ring | 4 | 70153-61071 |
| 56. | Connection Rod Assembly (1st) | 1 | 70153-61211 |
| 57. | Piston Pin Bush (1st) | 1 | 70153-61081 |
| 58. | Connecting Rod Assembly (2nd) | 1 | 70153-62211 |
| 59. | Piston Pin Bush (2nd) | 1 | 70153-62081 |
| 59A. | Piston Pin Needle Bearing (2nd) ** | 1 | 93503-TA2420 |
| 60. | Connecting Rod Bearing (2 Halves) | 2 | 70153-61090 |
| 61. | Crankshaft | 1 | 70153-56011 |
| 62. | Piston Pin (1st) | 1 | 70153-61121 |
| 63. | Compression Ring (2nd) | 3 | 70153-62030 |
| 64. | Piston Pin (2nd) | 1 | 70153-62121 |
| 65. | Oil Control Ring (2nd) | 1 | 70153-62050 |
| 66. | Piston (2nd) | 1 | 70153-62011 |
| 67. | Breather Assembly | 1 | CCC1258 |
| 68. | V-Pulley Pin | 1 | 70123-56061 |
| 69. | Nut (Connecting Rod) | 4 | 92501-230800 |
| 70. | Spring Washer (Connecting Rod) | 4 | 92522-130800 |
| 71. | Bolt (Connecting Rod) | 4 | 70153-61250 |
| 72. | Front Cover Gasket | 1 | 70153-57951 |
| 73. | Front Cover | 1 | 70153-57030 |
| 74. | Front Oil Seal | 1 | 70123-57080 |
| 75. | Copper Washer | 4 | 92521-190800 |
| 76. | Bolt (Front Cover) | 4 | 91501-1310030 |
| 77. | Compressor Pulley | 1 | 70153-76011 |
| 78. | Compressor Pulley Thrust Washer | 1 | 70123-76210 |
| 79. | Compressor Pulley Bolt | 1 | 91501-1310030 |
| 80. | Unloading Elbow * # | 1 | 79926-150101 |
| 81. | Unloader Assembly (2nd)(Includes 82-86) | 1 | 70153-12201 |
| 82. | Unloader Cover (2nd) | 1 | 70103-11271 |
| 83. | Viton O-Ring Unloader (2nd) | 1 | 93601-870009 |
| 84. | Unloading Piston (2nd) | 1 | 70153-12222 |
| 85. | Unloading Spring (2nd) | 1 | 70103-11231 |
| 86. | Unloader Body (2nd) | 1 | 70103-11211 |
| 87. | Air Strainer Assembly (Includes 88-93) | 1 | 70153-66002 |
| 88. | Air Strainer Cover Gasket | 1 | 70153-66132 |
| 89. | Air Strainer Cover | 1 | 70153-66121 |
| 90. | Air Strainer Bolt | 1 | 70153-66160 |
| 91. | Air Strainer Element | 1 | 70153-66142 |
| 92. | Nut (Self Lock) Air Strainer | 1 | 92507-230600 |
| 93. | Air Strainer Body | 1 | 70153-66012 |
| 94. | Intercooler Safety Valve (Not Shown) | 1 | VV431 |
| 95. | Gasket, Copper | 1 | 70152-12280 |
| | | | |

* Includes Nut(S) And Sleeve(S) # Not Supplied On Basics

** S/N A4081331 & Later

# INSPECTION & MAINTENANCE OF E-57 VALVE ASSEMBLY

## INSTRUCTION FOR E-57 COMPRESSOR MODEL HEAD VALVE ASSEMBLY INSPECTION AND MAINTENANCE.

Model E-57 valve assembly inspection and maintenance instruction.

1. Inspect valve assemblies every 1000 hours of operation or as necessary to maintain efficient operation.
2. Turn off power, red tag power supply switch (caution: Maintenance in progress – DO NOT START). Drain all air pressure from system before starting work.
3. Disconnect air piping from head.

Remove valve package.

A1. Loosen and remove head bolts. On constant run models, remove upper tubing from unloader cylinder.
A2. Remove cylinder head to expose valve assembly.
A3. Remove valve assembly, head to valve package gasket and valve package to cylinder gasket. Use new gaskets in re-assembly. Note conditions of cylinders, clean out any foreign material and cover with clean shop cloth while open.
A4. Refer to parts breakdown for description of valve package.
A5. Secure valve assembly package, loosen and remove socket head bolts to separate the upper and lower valve seats. This will expose the valve springs and valve plates.
CAUTION: Do not interchange upper and lower valve seats
A6. Thoroughly clean and wash all valve seats and parts with a suitable non-flammable cleaning fluid.
CAUTION: Use care to not scratch or deform valve parts in the cleaning.
A7. Carefully inspect the valve seats, plates and springs for dents, cracks, wear, and any reason to prevent proper and efficient operation.
A8. Replace all parts not in proper condition.

Assemble valve assembly package.

B1. Secure lower valve plate in flat position with spring slots “up”.
B2. Refer to parts breakdown for valve package breakdown.
B3. Place valve springs and valve plates in proper positions over slots in seat. Use tag wire or string for tie to hold in position for completing assembly.
B4. Secure upper valve seat in flat position with spring slots up
B5. Use new valve seat gasket.
B6. Place valve seat gasket in position on lower valve plate.
B7. Place upper valve seat with valve springs and plates tied in position on top of lower valve seat with new valve seat gasket in place between the two seats.
B8. Start center and then two end valve plates socket head bolts, tighten finger tight being careful not to damage seat gasket, use socket head wrench to torque the three bolts uniformly to secure the top valve seat to the lower valve seat using care to avoid damage to the gasket, and valve springs and plates from moving out of position.
B9. Remove ties to free valve springs and plates
B10. Check to be sure valve springs and valve plates are in proper position and the plates are free to flex when manually touched with blunt instrument.

Assemble valve assembly package into compressor.

C1. Use new gaskets, valve package to cylinder and cylinder head to valve package. Select gaskets by part numbers from parts breakdown.
C2. Remove shop cloth to expose open cylinder bores. Remove any foreign matter from cylinder bores and top of cylinder.
C3. Place gasket on top of cylinder, place and align valve package, place gasket on top of valve package and align holes for head bolts.
C4. Place clean head on top of valve package with gasket and align with cylinder bolt holes.
C5. Insert cylinder head bolts using care to avoid damage to the gaskets, start each bolt threading evenly to contact head surfaces.
C6. Torque head bolts equally, follow torque specifications on page 20.
C7. Attach and tighten copper tubing of constant running compressors.
C8. Assemble and tighten discharge tubing.
C9. Check oil level in crankcase
C10. Close and tighten valve or the connections used to drain air pressure from system.
C11. Remove all tools and make area safe to start compressor.
C12. Turn on power at main switch and inspect to see that unit is operating properly.
C13. Stay with unit for normal pump up to cut out pressure.
C14. If unit has performed through a running cycle properly put on line for duties and remove red tag from power supply switch.
C15. Make entry in equipment maintenance log.

# VALVE PLATES DESIGNS FOR E-57 COMPRESSOR

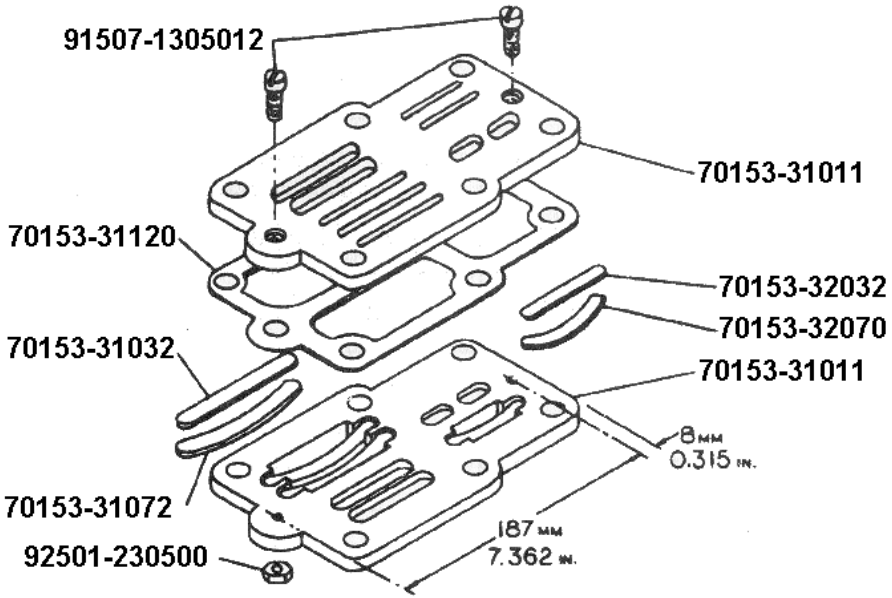



FIG. 1

**SERIAL NUMBER 6107030 THROUGH 6116445**

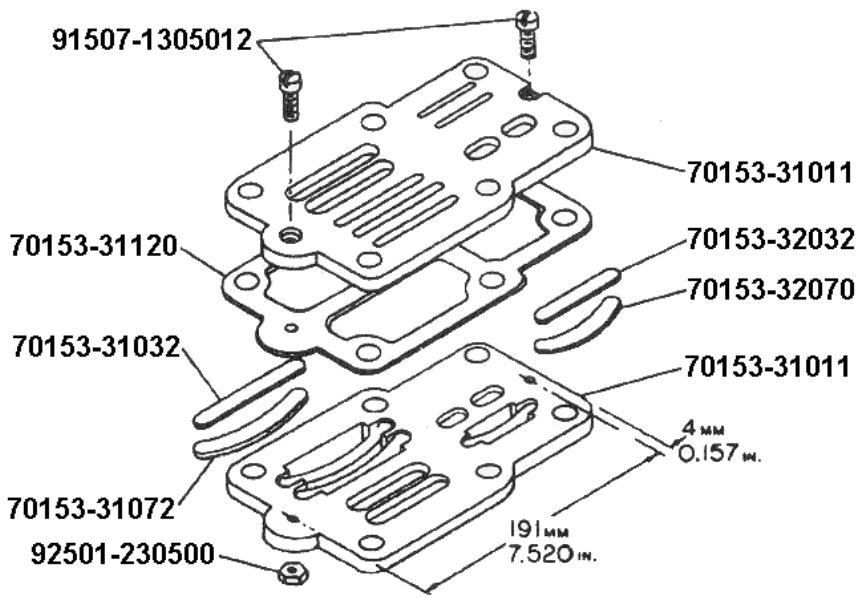



FIG. 2

**SERIAL NUMBER 7010603 THROUGH 7043734**

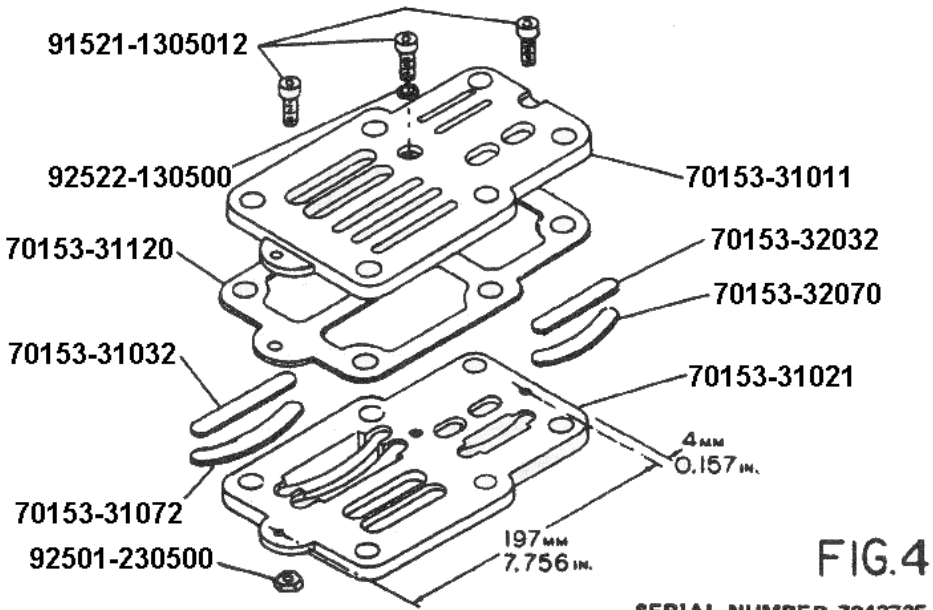



FIG. 4

**SERIAL NUMBER 7043735 AND LATER**

# BOLT TORQUES FOR CHALLENGE AIR COMPRESSORS

| | HEAD BOLTS | | CYLINDER-CASE | | ROD BOLTS | | FRONT COVER | | REAR COVER | | INLET & OUTLET VALVE PUSH COVERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SIZE BOLT | TORQUE CM-FT. | SIZE BOLT | TORQUE CM-FT. | SIZE BOLT | TORQUE CM-FT. | SIZE BOLT | TORQUE CM-FT. | SIZE BOLT | TORQUE CM-FT. | SIZE BOLT | TORQUE CM-FT. |
| ES03 | M6-1 | 120-8.7 | | | M6-1 | 135-9.7 | M6-1 | 100-6.8 | M6-1 | 100-6.8 | | |
| ES05 | M8-1.25 | 200-14.5 | M8-1.25 | 200-14.5 | M8-1.25 | 180-13.0 | M8-1.25 | 180-13.0 | M6-1 | 100-6.8 | | |
| ES06 | M6-1 | 120-8.7 | M6-1 | 120-8.7 | M6-1 | 135-9.7 | M6-1 | 100-6.8 | M6-1 | 100-6.8 | | |
| ES10 | M8-1.25 | 200-14.5 | M8-14.5 | 200-14.5 | M8-1.25 | 180-13.0 | M8-1.25 | 180-13.0 | M8-1.25 | 180-13.0 | | |
| E11 | M8-1.25 | 200-14.5 | M8-1.25 | 200-14.5 | M8-1.25 | 180-13.0 | M8-1.25 | 180-13.0 | M8-1.25 | 180-13.0 | | |
| ES20 | M8-1.25 | 200-14.5 | M8-1.25 | 200-14.5 | M8-1.25 | 180-13.0 | M8-1.25 | 180-13.0 | M8-1.25 | 180-18.0 | | |
| E23 | M8-1.25 | 200-14.5 | M8-1.25 | 200-14.5 | M8-1.25 | 180-13.0 | M8-1.25 | 180-13.0 | M8-1.25 | 180-13.0 | | |
| ES30 | M10-1.5 | 300-21.7 | M10-1.5 | 280-20.25 | M10-1.5 | 280-20.25 | M10-1.5 | 280-20.25 | M10-1.5 | 280-20.25 | M8-1.25 | 225-16.3 |
| E35 | M8-1.25 | 200-14.5 | M8-1.25 | 200-14.5 | M8-1.25 | 180-13 | M8-1.25 | 180-13 | M8-1.25 | 300-21.7 | | |
| ES50 | M10-1.5 | 300-21.7 | M10-1.5 | 280-20.25 | M8-1.5 | 280-20.25 | M8-1.5 | 280-20.25 | M10-1.5 | 280-20.25 | M8-1.25 | 225-16.3 |
| E50 | M10-1.5 | 300-21.7 | M10-1.5 | 280-20.25 | M8-1.5 | 280-20.25 | M8-1.5 | 280-20.25 | M10-1.5 | 280-20.25 | M8-1.25 | 225-16.3 |
| E57 | M10-1.5 | 320-23.1 | M10-1.5 | 280-20.25 | M8-1.25 | 280-20.25 | M10-1.5 | 300-21.7 | M8-1.25 | 300-21.7 | | |
| ES100 | M10-1.5 | 320-23.1 | M10-1.5 | 280-20.25 | M8-1.5 | 300-21.7 | M8-1.5 | 300-21.7 | M10-1.5 | 280-20.25 | M8-1.25 | 225-16.3 |
| E71 | M10-1.5 | 320-23.1 | M10-1.5 | 280-20.25 | M8-1.5 | 300-21.7 | M8-1.5 | 300-21.7 | M10-1.5 | 280-20.25 | M8-1.25 | 225-16.3 |
| ES150 | M10-1.5 | 320-23.1 | M10-1.75 | 350-25.3 | M10-1.5 | 320-23.1 | M10-1.5 | 320-23.11 | M10-1.5 | 28-120.25 | M10-1.5 | 320-23.1 |
| E15 | M10-1.5 | 320-23.1 | M10-1.75 | 350-25.3 | M10-1.5 | 320-23.1 | M10-1.5 | 320-23.1 | M10-1.5 | 280-20.25 | L M10-1.5<br>H M8-1.25 | 320-23.1<br>225-16.3 |

## BOLT TORQUES

| MODEL NO. | FLYWHEEL BOLTS | | FAN BOLTS | |
|---|---|---|---|---|
| | TORQUE FT.-LBS. | TORQUE IN.-LBS. | TORQUE FT.-LBS. | TORQUE IN.-LBS. |
| ES03 | 8 | 96 | - | - |
| ES05<br>ES06<br>ES10<br>E11<br>ES20<br>E23<br>E35 | 12 | 144 | - | - |
| E57 | 23 | 276 | - | - |
| ES30 | 30 | 360 | - | - |
| ES50<br>E50 | 40 | 480 | - | - |
| E71<br>ES100 | 45 | 540 | 24 | 288 |
| E15<br>ES150 | 50 | 600 | 24 | 288 |

## OIL CAPACITIES

| MODEL NUMBER | HORSEPOWER | MIN RPM | OIL CAPACITY |
|---|---|---|---|
| ES03 | 1/4 – 1/2 | 500 | 1/2 PINTS |
| ES05 | 1/2 | 500 | 1/2 PINTS |
| ES06 | 3/4 | 500 | 10 OUNCES |
| ES10 | 1 | 500 | 1¼ PINTS |
| ES20 | 2 – 3 | 500 | 1¾ PINTS |
| ES30 | 3 – 5 | 500 | 1¼ PINTS |
| ES50 | 5 – 7½ | 500 | 1½ QUARTS |
| ES100 | 7½ - 10 | 500 | 2½ QUARTS |
| ES150<br>ES150A | 15 | 500 | 5 QUARTS |
| E11 | 1 | 500 | 1¼ PINTS |
| E23 | 2 – 3 | 500 | 1¾ PINTS |
| E35 | 3 – 5 | 500 | 2½ PINTS |
| E50 | 5 | 500 | 1½ QUARTS |
| E57 | 5 – 7½ | 500 | 2 QUARTS |
| E71 | 10 | 500 | 2½ QUARTS |
| E15 | 15 | 500 | 5 QUARTS |

# TROUBLESHOOTING

| | SYMPTOMS | CAUSES | REMEDIES |
|---|---|---|---|
| WHEN COMPRESSOR CAN BE STARTED | Flywheel rotation in wrong direction | Incorrect connection of motor terminal | Re-arrange terminal connection. |
| | Overheating of bearings | 1. Insufficient lubrication.<br>2. Bad lubrication system.<br>3. Crankshaft bearings to tight. | 1. Add lubrication oil.<br>2. Remove and examine the system.<br>3. Readjust load on bearings. |
| | Flywheel rotation slows down | 1. Heavy lubrication oil.<br>2. Drop in voltage.<br>3. Belts slipping. | 1. Refill with lighter lubrication oil.<br>2. Contact power company or install a transformer.<br>3. Tighten belts |
| | Severe vibration | Bent crankshaft | Remove & Replace |
| | Abnormal noise | 1. Loose valve assembly.<br>2. Piston hits cylinder cover.<br>3. Worn connecting rod bearing. | 1. Tighten valve bolt and lock nut.<br>2. Check piston & rod assembly for excessive wear.<br>3. Replace bearing. |
| | Pressure cannot be built up or only up to a certain extent | 1. Worn valve plate.<br>2. Valve springs have lost their temper.<br>3. Dirt on the valve plate.<br>4. Leaks from safety valve.<br>5. Leaks from bolt holes.<br>6. Uneven valve seat surface.<br>7. Excessive blow by on piston rings.<br>8. Bad packing (gasket to thick).<br>9. Excessive air leaks. | 1. Repair or replace valve plate.<br>2. Replace valve springs.<br>3. Remove and clean it.<br>4. Repair or replace safety valve.<br>5. Tighten the nuts even with packing.<br>6. Remove and lap the surface.<br>7. Replace with new ones<br>8. Replace packing (gasket).<br>9. Eliminate air leaks. |
| | Inaccuracy of pressure gauge | Pressure gauge damaged. | Replace. |
| | Excessive oil consumption | 1. Worn piston ring<br>2. Worn piston.<br>3. Worn cylinder. | 1. Replace.<br>2. Replace.<br>3. Replace. |
| | Slipping of belts | 1. Working pressure too high.<br>2. Improper belt tension.<br>3. Worn belt. | 1. Lower working pressure.<br>2. Adjust belt tension.<br>3. Replace with new ones. |
| | Overheating of electric motors | 1. Overloading of motor due to excessive working pressure (higher than stipulated pressure).<br>2. Burnt piston.<br>3. Burnt bearing metals.<br>4. Drop of voltage. | 1. Lower working pressure.<br>2. Rebuild compressor.<br>3. Rebuild compressor.<br>4. Contact power company or install a transformer |
| **WHEN COMPRESSOR CANNONT BE STARTED** | Unit will not start | 1. Breakdown of electric current.<br>2. Line failure.<br>3. Malfunction of motor | 1. Contact power company.<br>2. Examine the line. Replace with new wiring.<br>3. Contact motor manufacturer. |
| | Fuse tends to blow | 1. Incorrect size.<br>2. Wrong connections<br>3. Overloading of motor.<br>4. Overloading of motor due to leaks of outlet valve.<br>5. Crankshaft too tight. | 1. Replace with correct size.<br>2. Change connections.<br>3. Eliminate the loading.<br>4. Remove and repair outlet valve.<br>5. Remove crankshaft and examine it for cause. |

# RECOMMENDED STATEMENT ON DRYERS AND FILTERS

Liquid water occurs naturally in air lines as a result of compression. Moisture vapor in ambient air is concentrated when pressurized and condenses when cooled in downstream air piping.

Compressed air dryers reduce water vapor concentration and prevent liquid water formation in compressed air lines. Dryers are necessary companion to air filters, aftercoolers, and automatic tank drains for improving the productivity of compressed air systems.

Water and water vapor removal increases the efficiency of air operated equipment, reduces contamination and rusting, increases service life of pneumatic equipment and tools, prevents air line freeze ups, and reduces product rejects. The use of dryer's filters is recommended when this moisture related problems are reported to our factory or distributor service departments.

Troubleshooting guide

| | |
|---|---|
| Symptom: | Liquid water present in compressed air lines. |
| Problem: | Water vapor condensation from cooling and compression occurs naturally |
| Solution: | Remove the water vapor from compressed air prior to distribution through the air system. Check operation of after-cooler and moisture separator. Install a compressed air dryer sized for the flow and dryness level required.<br><br>(Note: filters may also be required to remove particles, liquid oil aerosols, or for oil vapor removal. Change cartridges as recommended by filter manufacturer.)<br><br>Check all drain traps routinely to insure their proper operation. Maintain them regularly. |

# COMPRESSOR PUMP-UP TIME

## TWO STAGE

| H.P. Size | Compressor Model No. | R.P.M. | Piston Displ. C.F.M. | Tank size | | Approx. Time Required To Pump From: | |
|---|---|---|---|---|---|---|---|
| | | | | Size (in) | Gal | 0 to 175 PSIG Min. – Sec. | 145 to 175 PSIG Min. – Sec. |
| 3 | 3VT6 | 947 | 10.66 | 20 x 50 | 60 | 12’ – 24” | 2’ – 8” |
| 5 | 5E23VT6 | 1000 | 11.3 | 20 x 50 | 60 | 11’ – 47” | 2’ – 1” |
| 5 | 5E1HT6 | 1100 | 15.81 | 20 x 50 | 60 | 7’ – 46” | 1’ – 20” |
| 5 | 5E1VT6 | 1100 | 15.81 | 20 x 50 | 60 | 7’ – 46” | 1’ – 20” |
| 5 | 5E1HT8 | 1100 | 15.81 | 20 x 48 | 80 | 10’ – 21” | 1’ – 46” |
| 5 | 5E1VT8 | 1100 | 15.81 | 20 x 48 | 80 | 10’ – 21” | 1’ – 46” |
| 5 | 5HT6 | 968 | 20.58 | 20 x 50 | 60 | 5’ – 56” | 1’ – 1” |
| 5 | 5VT6 | 968 | 20.58 | 20 x 50 | 60 | 5’ – 56” | 1’ – 1” |
| 5 | 5HT8 | 968 | 20.58 | 20 x 66 | 80 | 7’ – 54” | 1’ – 21” |
| 5 | 5VT8 | 968 | 20.58 | 20 x 48 | 80 | 7’ – 54” | 1’ – 21” |
| 5 | 5E2HT6 | 900 | 21.47 | 20 x 50 | 60 | 5’ – 25” | 0’ – 56” |
| 5 | 5E2VT6 | 900 | 21.47 | 20 x 50 | 60 | 5’ – 25” | 0’ – 56” |
| 5 | 5E2HT8 | 900 | 21.47 | 20 x 66 | 80 | 7’ – 14” | 1’ – 14” |
| 5 | 5E2VT8 | 900 | 21.47 | 20 x 48 | 80 | 7’ – 14” | 1’ – 14” |
| 7 1/2 | 7E2HT8 | 1100 | 26.24 | 20 x 66 | 80 | 6’ – 16” | 1’ – 05” |
| 7 1/2 | 7E2VT8 | 1100 | 26.24 | 24 x 48 | 80 | 6’ – 16” | 1’ – 05” |
| 7 1/2 | 7HT8 | 764 | 29.57 | 20 x 66 | 80 | 5’ – 22” | 0’ – 55” |
| 10 | 10HT8 | 977 | 37.81 | 20 x 66 | 80 | 4’ – 11” | 0’ – 43” |
| 10 | 10HT12 | 977 | 37.81 | 24 x 70 | 120 | 6’ – 17” | 1’ – 5” |
| 10 | 10VT12 | 977 | 37.81 | 30 x 47 | 120 | 6’ – 17” | 1’ – 5” |
| 15 | 15HT12 | 855 | 54.55 | 24 x 70 | 120 | 4’ – 28” | 0’ – 46” |

## TWO STAGE GASOLINE ENGINE DRIVEN

| H.P. Size | Compressor Model No. | R.P.M. | Piston Displ. C.F.M. | Tank size | | Approx. Time Required To Pump From: | |
|---|---|---|---|---|---|---|---|
| | | | | Size (in) | Gal | 0 to 175 PSIG Min. – Sec. | 145 to 175 PSIG Min. – Sec. |
| 10 | 10E2GT3 | 910 | 21.7 | 16 x 41 | 30 | 2’ – 42” | 0’ – 28” |
| 10 | 10GT3 | 950 | 20.2 | 16 x 41 | 30 | 3’ – 1” | 0’ – 31” |
| 10 | 10GT6 | 950 | 20.2 | 20 x 50 | 60 | 6’ – 3” | 1’ – 2” |
| 13 | 13E2GT3K | 910 | 21.7 | 16 x 41 | 30 | 2’ – 42” | 0’ – 28” |
| 13 | 13GT3K | 950 | 20.2 | 16 x 41 | 30 | 3’ – 1” | 0’ – 31” |
| 13 | 13GTGK | 950 | 20.2 | 20 x 50 | 60 | 6’ – 3” | 1’ – 2” |
| 13 | 13E2GT3HE | 910 | 21.7 | 16 x 41 | 30 | 2’ – 42” | 0’ – 28” |

# COMPRESSOR PUMP-UP TIME

## SINGLE STAGE

| H.P. Size | Compressor Model No. | R.P.M. | Piston Displ. C.F.M. | Tank size | | Approx. Time Required To Pump From: | |
|---|---|---|---|---|---|---|---|
| | | | | Size (in) | Gal | 0 to 100 PSIG Min. – Sec. | 80 to 100 PSIG Min. – Sec. |
| 3 | 3HS6 | 945 | 15.97 | 20 x 50 | 60 | 6’ – 16” | 1’ – 15” |
| 3 | 3VS6 | 945 | 15.97 | 20 x 50 | 60 | 6’ – 16” | 1’ – 15” |
| 5 | 5ES20VS6 | 1000 | 16.9 | 20 x 50 | 60 | 6’ – 4” | 1’ – 13” |
| 5 | 5HS6 | 945 | 20.13 | 20 x 50 | 60 | 4’ – 8” | 0’ – 50” |
| 5 | 5VS6 | 945 | 20.13 | 20 x 50 | 60 | 4’ – 8” | 0’ – 50” |
| 5 | 5HS6 | 945 | 20.13 | 20 x 66 | 80 | 5’ – 31” | 1’ – 6” |
| 5 | 5VS8 | 945 | 20.13 | 24 x 48 | 80 | 5’ – 31” | 1’ – 6” |
| 7 1/2 | 7HS8 | 945 | 30.14 | 20 x 66 | 80 | 3’ – 35” | 0’ – 43” |
| 7 1/2 | 7VS8 | 945 | 30.14 | 24 x 48 | 80 | 3’ – 35” | 0’ – 43” |
| 10 | 10HS8 | 866 | 50.4 | 20 x 66 | 80 | 2’ – 7” | 0’ – 25” |
| 10 | 10HS12 | 866 | 50.4 | 24 x 70 | 120 | 3’ – 10” | 0’ – 38” |
| 10 | 10VS12 | 866 | 50.4 | 30 x 47 | 120 | 3’ – 10” | 0’ – 38” |
| 15 | 15HS12 | 855 | 81.74 | 24 x 70 | 120 | 2’ – 2” | 0’ – 24” |

# NOTES

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